DOCUMENT RESUME

ED 147 495 08 CE 013 385

TITLE	A Comprehensive Occupational Education System: Research and Experimentation in a Career Development Center. Volume II. Plan for a Comprehensive Occupational Education System in New York City's Borough of the Bronx.
INSTITUTION	New York City Board of Education, Brooklyn, N.Y. Div. of Educational Planning and Support.
SPONS AGENCY	Bureau of Occupational and Adult Education (DHEW/OE), Washington, D.C.
REPORT NO	498AH50188
PUB DATE	30 Aug 77
GRANT	G007500677
NOTE	422p.; For a related document see CE 013 383 ; Best copy available
EDRS PRICE	MF-$0.83 HC-$22.09 Plus Postage.
DESCRIPTORS	Adults; Comprehensive Programs; Delivery Systems; Demonstration Programs; Dropouts; Educational Facilities; Educational Needs; Educational Planning; Employment Problems; Guidance Centers; High School Students; Information Systems; *Job Placement; *Job Training; Labor Market; *Management Information Systems; Manpower Needs; Metropolitan Areas; Minority Groups; *Occupational Guidance; Program Coordination; Program Descriptions; School Community Cooperation; School Industry Relationship; Systems Approach; *Systems Development; Unemployed; *Urban Education; Urban Youth; Vocational Development; Vocational Education; Youth Employment
IDENTIFIERS	Comprehensive Occupational Education System; *New York (New York)

ABSTRACT

Designed to gather and analyze the information needed to develop a plan for a model comprehensive occupational education system (COES), this research project is reported in five chapters. Chapter 1 provides an overview of the project which was conducted in the Bronx borough of New York City because this area exemplifies the problems of urban education and has a high unemployment rate for minority teenagers. Chapter 2 defines the existing occupational education delivery system, identifies the unmet needs of the target population, and provides an analysis of the labor market. Chapters 3 and 4 present the plan for a COES and its component parts: a career development center (CDC), a centralized information system, and a career guidance system. Organized schemes for both a COES and a CDC are presented, as well as sections dealing with facilities planning, transportation and scheduling patterns, curriculum development, and coordination with business/industry/labor/community. The final chapter presents the conclusions and recommendations of the COER Project (Comprehensive Occupational Education Research). Suggested guidelines for developing such a system in other large cities are included in a companion document. (BM)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED147495

Project Number: 498 AH 50188
Grant Number: G007500677

A COMPREHENSIVE OCCUPATIONAL EDUCATION SYSTEM:
RESEARCH AND EXPERIMENTATION IN A CAREER DEVELOPMENT CENTER

Volume II

PLAN FOR A COMPREHENSIVE OCCUPATIONAL EDUCATION SYSTEM IN NEW YORK CITY'S BOROUGH OF THE BRONX

New York City Board of Education
Division of Educational Planning and Support
Center for Career and Occupational Education
George R. Quarles, Chief Administrator

Peter J. Mollo, Project Director

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

August 30, 1977

BEST COPY AVAILABLE

The research reported herein was performed pursuant to a grant with the Office of Education, U.S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. Department of Health, Education and Welfare
Office of Education
Bureau of Occupational and Adult Education

CE 013 385

BOARD OF EDUCATION OF THE CITY OF NEW YORK
Irving Anker, Chancellor

Members of the Board:

Stephen R. Aiello, President
Joseph G. Barkan, Vice President
Amelia Ashe
Robert J. Christen
James F. Regan
Luis Rivera
Isaiah E. Robinson

DIVISION OF EDUCATIONAL PLANNING AND SUPPORT
Arnold Webb, Executive Director

CENTER FOR CAREER AND OCCUPATIONAL EDUCATION
George R. Quarles, Chief Administrator

ACKNOWLEDGMENTS

This document was developed as a product of the research project, "Plan for a Comprehensive Occupational Education System in New York City - Research and Experimentation in a Career Development Center" (U.S. Office of Education, funded Part C [VEA]). It presents the results of research on the development of such a system in New York City, and specifically in the Borough of the Bronx. A companion document is presented primarily as a guide to directors of occupational education in large cities seeking to develop a comprehensive occupational education system.

In effecting this Comprehensive Occupational Education Research (COER) Project, the Center for Career and Occupational Education is indebted to Dr. Jack A. Wilson, USOE Project Officer, for his interest and guidance; to Dr. Peter J. Mollo, Project Director, and other members of the COER staff, for their dedicated efforts; and to the National Panel of Consultants who, under the chairmanship of Dr. Robert M. Worthington, contributed significantly to the Project from their wealth of experiences. Particular appreciation is expressed and warranted for the efforts of Dr. Joshua Schuckatowitz and Mr. Stanley Cohen and their associates in developing the current document into its final form.

The Center is also appreciative of the efforts of the many individuals of New York City, including repre-

sentatives of business and industry, education and community organizations, who have shared generously of their time and ideas in the implementation of the Project.

Finally, the assistance provided by staff of the Center for Career and Occupational Education, and their associates in other Centers of the Division of Educational Planning and Support, is acknowledged with gratitude.

George R. Quarles
Chief Administrator
Center for Career and
Occupational Education

CENTER FOR CAREER AND OCCUPATIONAL EDUCATION
George R. Quarles, Chief Administrator
Vincent A. Troiano, Deputy Administrator

PLANNING, EVALUATION AND RESEARCH UNIT
Dr. Fred W. Banes, Director

THE COMPREHENSIVE OCCUPATIONAL EDUCATION RESEARCH PROJECT
Dr. Peter J. Mollo, Project Director

PROJECT STAFF

William R. Ross	Coordinator of Planning
Isidore Chevat	Coordinator of Guidance
John B. Adam	Assistant Coordinator of Research
Leonard Bozza	Assistant Coordinator of Planning
Annie V. Wilkins	Guidance Counselor
Paul Basso	Statistician

PHILOSOPHY STATEMENT

In order to provide a comprehensive occupational education program for major metropolitan areas in the 1980's, it is essential that educational policy makers, administrators, and classroom teachers reach a concensus on a philosophy of occupational education. Most urban school districts have made known their philosophy of occupational education through the kinds of programs and delivery systems that have evolved. It is often difficult, if not impossible, to identify a specific statement that has been published as a philosophy. The following statement, therefore, represents an attempt to put together from many sources an eclectic philosophy of occupational education applicable to the great cities of America.

All individuals should have available to them programs of occupational education which will facilitate decision making about future careers. Persons of all ages should be provided with opportunities which will foster their personal career development. Such career development activities should develop understandings of the world of work and should provide for occupational awareness, occupational exploration, preparation for employment and job progression. These concepts are entirely consistent with the views of the Regents of the University of the State of New York as published in a position paper (No. 11) in 1971. (Attachment A)

Every individual should have an opportunity to develop positive attitudes about the social significance of work and should be provided with experience which will develop and expand occupational aspirations. Educational programs should be provided which will make it possible for every individual to evaluate interests, aptitudes and personal needs related to broad occupational goals.

Every individual should have access to quality programs of occupational education designed to provide skills and knowledge necessary to enter and progress in recognized occupations and/or in advanced educational programs. Access to such programs should not require commitment to participation in an extended sequence of programs but rather, open entry into specific training modules that can provide specific skills for employment or continuing education consistent with the individual's needs and capabilities. Career counseling and placement services should be available to anyone regardless of the time of their entry into or exit from occupational education.

There should be recognition by the educational system that all students will not be able to complete a long-term sequence of training programs that would provide a wide spectrum of skills for a given occupation. However, it should also be recognized that the system does have the responsibility of providing each individual with sufficient skills for employment and of assisting these individuals in continuation of their training when such training is consistent with the individual's needs and interests.

Finally, it should be recognized that the educational system needs to bring together all the facilities and resources of the geographic area to create comprehensiveness in its programs and services to students, industry and community.

TABLE OF CONTENTS

Page

PREFACE 1
CHAPTER ONE: OVERVIEW 5
1.1 COER Project Staffing, Methods and Procedures 12
  1.1.1 Staffing 12
  1.1.2 Methods and Procedures 16
Footnotes/Chapter One 21

CHAPTER TWO: THE NEED 23
2.1 Introduction 23
2.2 The Secondary School Age Population 27
  2.2.1 Universe of Need 27
    2.2.1.1 In-School Populations 29
    2.2.1.2 Out-of-School Populations . . 31
    2.2.1.3 Total Universe of Need - Secondary Age Population . . . 32
  2.2.2 The Existing Delivery System - Secondary Level 32
    2.2.2.1 The New York City Delivery System 36
    2.2.2.2 The Bronx Delivery System . . 38
  2.2.3 Net Demand for Occupational Education - Secondary School Age Population 40
2.3 The Adult Population 42
  2.3.1 Universe of Need 42
  2.3.2 Existing Delivery System 45
  2.3.3 Net Demand for Occupational Education - Adult Population 46
2.4 Summary: Total Demand for Occupational Education 47
2.5 The Need as Determined Through Labor Market Analysis 49
  2.5.1 Employment Trends at the National Level 52
    2.5.1.1 Growth Trends by Class of Industry 52
    2.5.1.2 Growth Trends by Occupation . 58
  2.5.2 Employment Trends in New York City . . 67
    2.5.2.1 General Trends 67
    2.5.2.2 Specific Occupational Trends 73
    2.5.2.3 Summary of Findings: The NYC Labor Market 78

TABLE OF CONTENTS (cont'd)

Page

2.5.3 Report on Process 83

2.6 The Need as Determined Through Interest Surveys 89

Footnotes/Chapter Two 99

CHAPTER THREE: MASTER PLAN FOR A COMPREHENSIVE OCCUPATIONAL EDUCATION SYSTEM 103

3.1 Introduction 103

3.2 Organizational Design of a COES 106
   3.2.1 Organizational Design for the COES Guidance System 112

3.3 Elements of the COES 116
   3.3.1 Career Awareness Program (K-6) 116
   3.3.2 Career Exploration Program (7-9) 116
   3.3.3 Occupational Education Programs in the High Schools 117
   3.3.4 Occupational Education Programs for Adults and Out-of-School Youth 118

3.4 Coordination of COES Elements 119
   3.4.1 Pre-High School Elements 119
   3.4.2 High School Elements 120
   3.4.3 Occupational and Vocational Programs for Adults and Out-of-School Youth . . 124
   3.4.4 Articulation Between the Secondary Level and the "Next Step" 124

3.5 Components of the COES 125
   3.5.1 Centralized Information System 125
   3.5.2 Curriculum Development 131
   3.5.3 Staff Development and Training 138
   3.5.4 The Guidance Program 141
      3.5.4.1 Introduction 141
      3.5.4.2 The Current Situation 143
      3.5.4.3 A Guidance System for the COES 147
   3.5.5 Coordination with Business, Labor, Industry and the Community 156

Footnotes/Chapter Three 165

CHAPTER FOUR: THE CAREER DEVELOPMENT CENTER . . . 167

4.1 Program Design 167
   4.1.1 Magnet Schools 168

4.2 Occupational Training Programs at the CDC . . 170
   4.2.1 The CMI Approach 174

TABLE OF CONTENTS (cont'd)

Page

4.3 The CDC Guidance Program 178
  4.3.1 Introduction 178
  4.3.2 Organization 179
    4.3.2.1 Career Information Center . . . 180
    4.3.2.2 Career Planning and Counseling . 181
    4.3.2.3 Job Placement and Follow-up . . 182
    4.3.2.4 Community Outreach. 183

4.4 CDC Coordination with the Community 184
  4.4.1 The CDC Director 186

4.5 CDC Facilities 188
  4.5.1 Planning a Facility 189

4.6 CDC Location, Transportation Patterns, Scheduling and Coordination of Students 206
  4.6.1 Location/Transportation Patterns 206
  4.6.2 Scheduling 208

Footnotes/Chapter Four 213

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS . . . 215

5.1 Centralization 217

5.2 Labor Market Information 219

5.3 Curriculum 221

5.4 Involvement of Business, Labor, Industry, and the Community 223

5.5 Public Relations 225

5.6 Guidance and Counseling 227

5.7 Staff Development 229

5.8 Articulation 231

5.9 Monitoring, Evaluation and Accountability . . . 233

5.10 Remediation and Support Services 235

5.11 Handicapped and Bilingual Students 237

5.12 Career Development Center 239

ATTACHMENTS . . . .

TABLES AND ILLUSTRATIONS

Page

Figure 1.1 COER Project Administration and Staff . 14
Figure 2.1 Universe of Need 24
Figure 2.2 The Current Occupational Training System in New York City 37
Figure 2.3 Employment Growth, by Industry, through the Mid-1980's 53
Figure 2.4 Employment by Major Occupational Group . 59
Figure 2.5 Shift in Employment Toward White-Collar Jobs 59
Figure 2.6 Utilization of Worker Categories, by Industry 61
Figure 2.7 Employment Growth through the Mid-1980's by Occupation 61
Figure 2.8 Projected Job Openings due to Growth and Replacement 66
Figure 2.9 High School Interest Questionnaire Results 91
Figure 2.10 Junior High School Interest Survey Results 92
Figure 2.11 Long-Term Absentee Interest Survey Results 93
Figure 2.12 Parental Interest Survey Results 94
Figure 2.13 Bronx Career Counseling Interest Survey Results 95
Figure 3.1 Present Organization for Delivery of Occupational Education and Support Services 107
Figure 3.2 Proposed Organization for a Comprehensive Occupational Education System 109-110
Figure 3.3 An Administrative Structure for Occupational Guidance for the COES and CDC . . 113
Figure 4.1 Program Design, CDC and Magnet School System 169
Figure 4.2 Clusters for a CDC 173

TABLES AND ILLUSTRATIONS (cont'd)

Page

Figure 4.3 Space Relations Diagram 200
Figure 4.4 Schematic Layout for a CDC 202
Figure 4.5 Location and Transportation Patterns for a Career Development Center in the Bronx 207

Table 2.1 Universe of Need: Secondary School Age Population 33
Table 2.2 Existing Delivery System: Public School System, Secondary School Age Population .35
Table 2.3 Net Demand for Occupational Education, Secondary Age Population 41
Table 2.4 Adult Population in Need of Employment-Related Services - the Bronx 44
Table 2.5 Total Universe of Need for Occupational Training 45
Table 2.6 Existing Delivery Capacity 46
Table 2.7 Net Demand for Occupational Training - Adult Population 46
Table 2.8 Net Demand for Occupational Training . .48
Table 2.9 Employment in New York City by Major Industry Category 68
Tablw 2.10 1976 Projections of Non-College Occupations by Major Occupational Category Excluding Agriculture 70
Table 2.11 1976 Projections of Non-College Occupations by Major Occupational Category and Subcategory 71
Table 2.12 Average Annual Job Openings 1976-1980, "Top" Twenty Projected Jobs 74
Table 2.13 Average Annual Job Openings, 1976-1980, Jobs Projected to Show Moderate Growth .76
Table 2.14 Average Annual Job Openings, 1976-1980, Jobs Projected to Show Greatest Decrease.77
Table 2.15 COER Project Interest Surveys, Occupational Ranks by Average of Ranks 98

TABLES AND ILLUSTRATIONS (cont'd)

Page

Table 3.1 "Where did you get the most information about the career in which you are interested?" 144

Table 3.2 "Where would you go to get career information (in the future)?" 146

PREFACE

America's great cities are faced with serious problems. Extensive unemployment, increasing crime, diminishing tax bases, and population shifts are placing serious burdens on major metropolitan areas. Large numbers of youth who are out of school and out of work in our big cities represent a national problem, which stems in part from their dissatisfaction with present educational offerings. The Bureau of Labor Statistics reported in 1975 that more than three and a half million young people with no salable skills were attempting to enter the labor market. At the same time, employers were experiencing an increasing need for better-trained entry-level persons with higher degrees of skill.

The problem is particularly acute in New York City, where minority populations are caught in the familiar web of unemployment, under-employment, and lack of training. The rate of unemployment for non-white youth is more than double that of white youth. And with the unemployment rate of out-of-school teenagers in the 16-19 year age bracket nearing 20%, the situation is desperate. In New York City alone, more than 30,000 students drop out of public secondary schools each year prior to graduation. These dropouts are often deficient in salable skills and stand generally low in academic achievement; consequently, they tend to join the ranks of the unemployed. The City's economy offers few opportunities for the inexperienced, unskilled, functionally illiterate dropout.

In addition, it has been estimated that 35% of New York City's adult population is in need of training, retraining, or upgrading of skills for gainful employment.

As in the case of the high school dropout, a high percentage of these adults come from those who are disadvantaged. It is essential that New York and other great cities develop alternative strategies to meet the pressing needs of increasing numbers of individuals to learn entry-level skills in areas which offer opportunities for employment.

As a result of this situation, a proposal was submitted to the United States Office of Education to research this subject. The purpose of this research was twofold: first, to develop potential solutions to New York City's needs; and second, to develop information and recommendations that might be of value to other large urban areas facing the same problems as New York.

The Comprehensive Occupational Education Research (COER) Project was initiated in New York City to design a comprehensive occupational education system to meet the long-range occupational education and training needs of the youth and adults of the City. The planning process and experiences of the COER staff yielded valuable data relative to, and insights into alternative approaches for the delivery of occupational education in the City. At the same time, because the demography and economics of the City are similar to those of other large cities, Project COER provided a number of general ideas and "how to" alternatives of widespread applicability to the urban areas of the nation.

This document reflects the results of research conducted as part of the COER Project. The research focused on a comprehensive occupational education system for the Borough of the Bronx -- an urban area which is more comparable in size to many cities in the nation than would be the City of New York. It was felt that the research and plans for a comprehensive occupational education system and a career development center in the Bronx would be applicable to, and capable of replication in, other areas of the City, as well as other metropolitan areas of the nation.

This document, designated, Volume II, reflects the input of literally volumes of data, statistics and information gathered as part of one of the most comprehensive studies on urban occupational education in the United States. The bulk of the supporting material and research data has been collected as an associated "Appendix" volume.

A companion document (Volume I) presents suggested guidelines arising from the COER Project which may, at least in part, be of interest to directors of occupational education in other metropolitan areas. Although not designed specifically as a step-by-step manual for planning occupational education in a major metropolitan area, it does provide useful basic ideas based on a combination of research evidence and the judgment of experienced practitioners.

It is expected that all three volumes, developed as a result of the COER Project, will become part of the ERIC system.

* * * * *

New York, like many other large cities, is rich in human and physical resources, but poor in financial reserves. By sheer weight of numbers, the New York City Board of Education operates the most extensive occupational education program in the free world; yet substantial inadequacies continue to exist (e.g., educational/vocational guidance and coordination with business/industry/labor require strengthening). The primary mission of the COER Project was to conduct the research necessary to develop a feasible plan for marshaling these resources into a system capable of meeting the needs of students and employers. The resultant Comprehensive Occupational Education System (COES) would link all existing facilities and programs together into a functioning, integrated design. The proposed Career Development Center (CDC) is designed to provide the educational options necessary to fill gaps in the COES.

It is the sincere hope of all those connected with the COER Project that this report will hasten the installation of such a system, thus contributing to the educational betterment of the Bronx and of New York City as a whole.

CHAPTER ONE

OVERVIEW

In a city as complex, as diversified, and as large as New York, no one type of high school or educational program will suffice to meet the needs of its secondary school and adult populations, particularly their occupational training needs for entry-level and upgraded employment.

New York City offers a large number of occupational programs at a variety of facilities. At the secondary level, programs are offered at all of the academic/comprehensive high schools, as well as at seventeen multi-trade and six unit-trade vocational and technical high schools.

The vocational high schools offer more than 50 vocational programs, with a total enrollment of approximately 45,000. In addition, the academic/comprehensive high schools offer vocational training to approximately 76,000, for a total of 121,000 students receiving vocational training. (Exploratory and prevocational progams are also offered to an additional 69,000 students.)

But despite these extensive occupational program offerings in New York City high schools, more than 10,000 students cannot be accommodated in the vocational high schools each year. This is largely the result of limited training facilities. An even greater deficiency exists in the academic/comprehensive high schools, where course offerings are extremely limited. (Of the 63 occupational courses offered in the Bronx, 34 [54%] are offered in only one school, with typing the only course offered at all schools. Again, this is due primarily to a lack of facilities.)

Recognizing the need for a more comprehensive system in order to provide a broad variety of course offerings and educational experiences[1] the Bronx Comprehensive Career Campus was opened in 1973. This represented a program which was meant to establish a comprehensive occupational education system for the borough of the Bronx. But it soon became apparent that there was a need for a great deal more information than was available in order to set up a comprehensive system. In light of these facts, a research project was proposed to gather and analyze the needed information, and to develop a plan for a model Comprehensive Occupational Education System (COES).

The original objectives of the Comprehensive Occupational Education Research (COER) Project were to:

- design a master plan for the implementation of a Comprehensive Occupational Education System in the City of New York; develop a prototype which could be field-tested in one of the 32 community school districts (or similar geographic area) at the conclusion of the project;
- improve coordination and cooperation with business, industry, and community organizations;
- identify, evaluate and collect current and projected metropolitan manpower needs, and infuse such data into the plan for a COES;
- determine the optimum time frames appropriate for developing various entry-level occupational competencies;

- design an administrative structure for guidance, counseling, placement and followup services for all youth and adults;
- determine attitudes toward the proposed new delivery system and design a plan to respond to same;
- determine the personnel needs and competencies required to implement the plan;
- develop performance objectives based on projected manpower needs;
- determine the feasibility of converting a variety of facilities, including a traditional vocational education facility, to a magnet Career Development Center; and
- develop a management plan for a pilot magnet Career Development Center in a large city.

The complexity and size of New York City and its educational system precluded its use as the model for development of a comprehensive occupational education system. Thus the geographic area was limited, for purposes of the study, to the borough level. A model could then be developed on this smaller scale, which would also be comparable in size to most large urban areas in the nation.[2] That model, when proven successful and its potential benefits demonstrated, could then be replicated in other boroughs of New York City (or other urban areas), and integrated into a total city-wide COES.

The borough selected for this study was the Bronx, since it is the borough which most clearly exemplifies the problems of urban education, particularly occupational education. The Bronx has the highest concentration of minority populations in New York City (56%)[3] with the unemployment rate for minority teenagers estimated to be as high as 72%.[4] This latter factor is one of the reasons for the decision to use the Bronx as the model for a COES.

The results of this research effort confirmed the need for, and the potential benefits of, a Comprehensive Occupational Education System, and its component parts (a Centralized Information System, a Career Development Center, a career guidance system, and coordination with business, industry, labor and the community).

As an example of this need, it can be stated that while a great variety of programs and courses are currently available, the options for any one individual are severely limited. As cited previously, of the courses offered in the academic/comprehensive high schools in the Bronx, 54% are offered in only one school.[5] The number of occupational courses offered ranges from six to 20. Students are generally limited to those courses offered in their home school, with the Shared Instructional Program and the After School Occupational Skills Program offering a few additional options. However, the full range of occupational training offerings is not available to any one student.

While there are wide gaps in the area of occupational training, a related factor -- career guidance -- also exhibits a need for improvement in order to close the gaps in the present career guidance system. These gaps are due in part to the lack of counselors, but even moreso to the deficiency in career information. A counselor, in order to provide guidance in career decision-making, requires information on what training is available, but also on the characteristics and employment potential of numerous job categories. While this information is available, it is not presently to be found in a form that is readily usable by the counselor or the student.

The plan for a Comprehensive Occupational Education System, as presented in this report, is designed to close these gaps in the present occupational delivery system, as well as to provide flexibility within that system to meet the changing needs of both the student and the employer.

* * * * *

Chapter Two of this report defines the existing occupational education delivery system and identifies the unmet needs of the target populations. The "net demand" for occupational training is derived by comparing the estimated number of those persons in "need" of occupational training with those who are receiving such training. Chapter Two also provides an analysis of the labor market, the results of which were then correlated with the interests of the target populations (as determined by a series of surveys). This comparison of labor market demand with interest in occupational training pointed out several cluster areas which, at this time, should prove successful in meeting the needs and interests of the target populations, as well as the needs of employers.

Chapters Three and Four present the plan for a COES and its component parts: a Career Development Center (the primary focus of Chapter Four), a Centralized Information System, and a Career Guidance System. Organizational schemes for both a COES and a CDC are presented, as well as sections dealing with facilities planning, transportation and scheduling patterns, curriculum development, and coordination with business/industry/labor/community. This plan is designed primarily to coordinate the presently fragmented parts of the existing occupational education delivery system, and to provide the means for adding those necessary and complementary components that will make the system truly comprehensive. The plan provides for flexibility and services, such that the system can meet the respective needs of its target populations.

The final chapter of this report presents the conclusions and recommendations of the COER project. These represent a consensus of staff researchers, as well as representatives of business, industry, labor and the community (as they participated through the Project's Steering Committee), the Bronx superintendents of public and parochial high schools, and the principals of the Bronx public high schools.

In summary, these recommendations are:

- to link all existing and new occupational skills training programs into a Comprehensive Occupational Education System. The COES would facilitate these linkages by using a Centralized Information System (CIS). The CIS should be designed to improve the accessibility of occupational skills training seats throughout the COES. The CIS would be housed in the Career Development Center (CDC).
- to implement a Career Development Center which would coordinate and initiate occupational skills training courses and programs to supplement existing programs in the COES;
- to provide guidance services to share career and training information, test, evaluate, and refer students to classes, jobs and services;
- to establish concrete and functional linkages with business, industry, labor and the community. The linkages would be directly related to course

offerings in the CDC, as well as throughout the COES, and would result from regular interaction between program staff and advisory committees.

1.1 COER PROJECT STAFFING, METHODS, AND PROCEDURES

1.1.1 Staffing

The Comprehensive Occupational Education Research Project was funded to develop "a model of a comprehensive occupational education system in New York City, including experimentation in a career development center." After funding of the Project, representatives of the Steering Committee and the Research Team met to discuss planning strategies for implementation of the Project and the selection of a Project Director. This meeting was called and chaired by Mr. George R. Quarles, Chief Administrator of the Center for Career and Occupational Education, and Principal Investigator for the Project.

After criteria for selection of the Project Director were developed, Project staff solicited candidates who had administrative and research backgrounds and/or training/experience/knowledge of metropolitan school systems (particularly in areas of occupational education and related programs and services). Solicitation of candidates was effected through widespread publicizing of the position and its associated responsibilities.

Following selection of the Project Director, basic elements of the research plan were reviewed in defining the desired qualifications of additional staff members. It was concluded that the project involved two major functions -- planning and research -- and that the key staff members should have backgrounds in these areas, as well as experience in occupational education delivery systems.

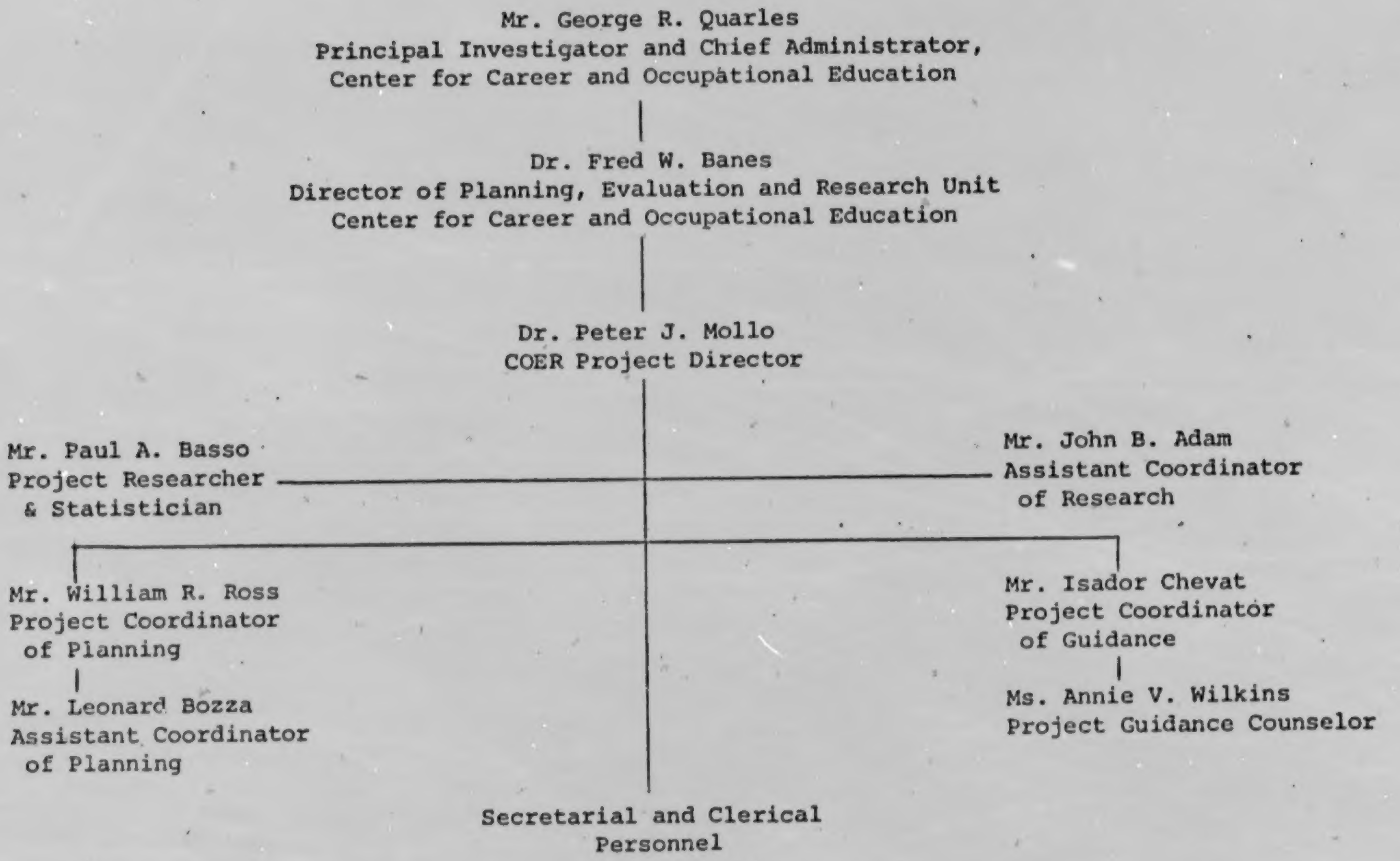
Since guidance and counseling were of such importance to the Project and to the occupational education system under consideration, it was also concluded that certain Project staff should have strong backgrounds in these areas. Finally, to effect the research program and associated surveys, data collection, etc., it was considered necessary to employ one staff person with a strong background in statistical procedures, computer programming, and related skills. (Project staff, their major areas of responsibility, and the organizational structure for the project are illustrated diagrammatically on the following page (Figure 1.1).

In carrying out the COER Project, the Project Director and staff worked directly under the supervision of Mr. George R. Quarles and Dr. Fred W. Banes, as indicated in the organization chart. Throughout the Project, periodic meetings were held with the Project Steering Committee and/or the Research Team to review and discuss Project activities, plans and progress.

As provided in the original proposal, a National Panel of Consultants was utilized by the Project as resource persons in providing information, direction and external evaluation. This panel of consultants was selected with great care, in order to obtain the services of individuals knowledgeable of the problems of urban occupational education. In each case, the individual consultant was a recognized authority on occupational education. The consultants, under the chairmanship of Dr. Robert M. Worthington, were able to offer objective counsel, taking the broader view of urban occupational education which might conceivably have escaped a local research group.

Figure 1.1

COER Project Administration and Staff


Mr. George R. Quarles
Principal Investigator and Chief Administrator,
Center for Career and Occupational Education
Dr. Fred W. Banes
Director of Planning, Evaluation and Research Unit
Center for Career and Occupational Education
Dr. Peter J. Mollo
COER Project Director
Mr. Paul A. Basso
Project Researcher
& Statistician
Mr. John B. Adam
Assistant Coordinator
of Research
Mr. William R. Ross
Project Coordinator
of Planning
Mr. Leonard Bozza
Assistant Coordinator
of Planning
Mr. Isador Chevat
Project Coordinator
of Guidance
Ms. Annie V. Wilkins
Project Guidance Counselor
Secretarial and Clerical
Personnel

Two meetings of the entire panel of consultants were convened in New York City. In addition, selected members of the panel were invited, on an individual basis, to advise on certain aspects of the Project.

Dr. Henry M. Brickell and the staff of the organization, Policy Studies in Education (PSE), were engaged to conduct formative evaluation studies for the Project. PSE staff followed all phases of the research study on a continuing basis, meeting regularly with COER Project staff to review plans and work progress, submitting formal reports which assessed the status and progress of the work, and conferring on several occasions during the course of the project with the Chief Investigator and members of his staff.

Staff of the Educational Planning Institute, under the supervision of Ms. Anita Moses, were contracted to conduct a study and macro-assessment of New York City job markets and a detailed investigation of employment opportunities in the Bronx. Summary information on the results of this extensive work is presented as separate reports entitled, "New York City Job Market Survey" and "Results and Analysis of Employer Survey in the Bronx." (Appendix 11)

Dr. Arthur Wilkins, of Reitter and Wilkins, Inc., was engaged to conduct a micro-assessment of the electro-mechanical occupations (specifically, business machines repair), to determine manpower needs and to define entry-level skill requirements. His survey of some 200 companies involved in this field was conducted utilizing the facilities and resources of the Dunn and Bradstreet organization. (Appendix 9)

Finally, Dr. August Gold, formerly the Administrator for the Division of Educational Facilities Planning, New York City Board of Education, was engaged to develop a model process for planning facilities for a Career Development Center.

1.1.2 Methods and Procedures

The methodology employed in implementing the COER Project focused on the development of information required to address the several objectives of the Project. Basically, this information was related to the various aspects of planning a comprehensive occupational education system and to the development of system components, namely, a Career Development Center, a comprehensive guidance system, and a management/student information system.

At the outset, effort was devoted to review of the literature for relevant information (concerning career guidance systems, skills centers, curriculum development, organizational and staff structures, and the role of advisory councils in occupational education). This literature review continued throughout the life of the project. (Appendix 1)

Several urban areas outside of New York City were visited in order to develop information on practices and experiences which could be of benefit to the COER Project. These included visits to skills centers in Philadelphia, Toledo, Cleveland, and Dallas, as well as certain of the BOCES Centers in New York State. Other site visits were made to large urban areas involved in the development and operation of quality occupational education systems, in order to gain information on planning processes, organizational structures, staffing patterns, etc. (Appendix 4)

Concurrent with these activities, research was conducted to develop comprehensive information on the New York City education, community and business environment. It was felt that such information was required in order to develop the "environment of need" and the documentation of information relative to occupational education activities in the City.

These "needs assessment" studies focused on demographic data, the location and types of program offerings, student participation in programs, and student-based information as to occupational interests, retention rates in schools, etc. The studies related not only to secondary school populations, but also to out-of-school youth and adults, handicapped populations, and populations with limited English-speaking ability. Our intent was to determine the extent to which these various populations were being served, and to define the need for expanded services (additional requirements for training programs and guidance, placement, followup, etc.).

A critical component of this "needs assessment" was the development and implementation of surveys of different populations in determining their interests, needs, attitudes and plans. Such surveys encompassed secondary school students, students with long-term truancy records, parents, junior high school students, and out-of-school youth and adults. (Appendix 12 - 15)

In addition to these formal surveys, information on the need for and attitudes toward occupational education and career development centers was developed through meetings with representatives of business, labor, education and the community (for example, those involved with the Project through membership on the Steering Committee and its sub-committees). In addition, a Bronx Advisory Commission for Occupational Education was instituted to bring together representatives of area businesses and community organizations to discuss needs and plans related to occupational education and systems for delivery of occupational education services. As planned, meetings of this Commission subsequently involved representatives of area public and private secondary schools, as well as representatives of the Bronx Parents' Association, the National Alliance of Businessmen, the South Bronx Economic Development Council, and other interested groups.

Based on the outcomes of the above activities, the COER staff developed conclusions as to the need for occupational education delivery services, as well as changes required to meet the need. Such need was found in the areas of program offerings, expanded program options, curriculum revision, facilities, guidance and counseling, testing, referral and placement services, job development activities, increased involvement of business and the community in educational processes, etc.

Based on the conclusions drawn from Project research, plans and proposed activities were developed as means of approaching the identified problems. Some of these activities were implemented as a means of obtaining specific information, but also as a way of testing the validity of the activities. For example, several approaches were employed in job market studies. These actual field tests proved to be helpful in obtaining more specific information on employment opportunities in specific occupational areas, as well as in testing the validity and value of different approaches. Similarly, field experiments and experiences (in New York City and in other large cities) confirmed the need for and value of modularized curricula, which would provide increased educational options for students, together with at least some aspects of individualized instruction.

All of the information developed through the Project was viewed in terms of the need for and benefits of a comprehensive occupational system and its components, including a Career Development Center. To this end, specific and concerted attention was devoted to factors surrounding the development and functions of a Career Development Center. This involved the determination of transportation and travel patterns for students, potential sites for the CDC, selected program offerings, scheduling, guidance and counseling functions, interrelations with other educational facilities and programs, involvement of business and the community, staff and personnel development, associated information and resource systems, etc. Of prime significance was the development of plans for a "model" facility that would illustrate the interrelation of all aspects of occupational education and their integration into a comprehensive occupational education system.

FOOTNOTES/CHAPTER ONE

[1] New york City Vocational Principals' Association position paper, "Vocational Education in the 70's -- a Statement and a Projection for New York City",1971. (Attachment A-1)

[2] New York City has a total population of over 7.5 million, with four of its five boroughs containing populations well in excess of one million. Thus any one of these four boroughs is, in fact, a large urban area.

[3] U.S. Census Bureau estimate, 1975.

[4] Estimate for male Puerto Rican teenagers, 1975. The Bronx also has the highest percentage of Puerto Ricans of any of the five boroughs (27%).

[5] See Attachments.

CHAPTER TWO

THE NEED

2.1 INTRODUCTION

In developing a comprehensive occupational education system, an essential first step is the definition of the need for occupational education training among the target populations to be serviced.

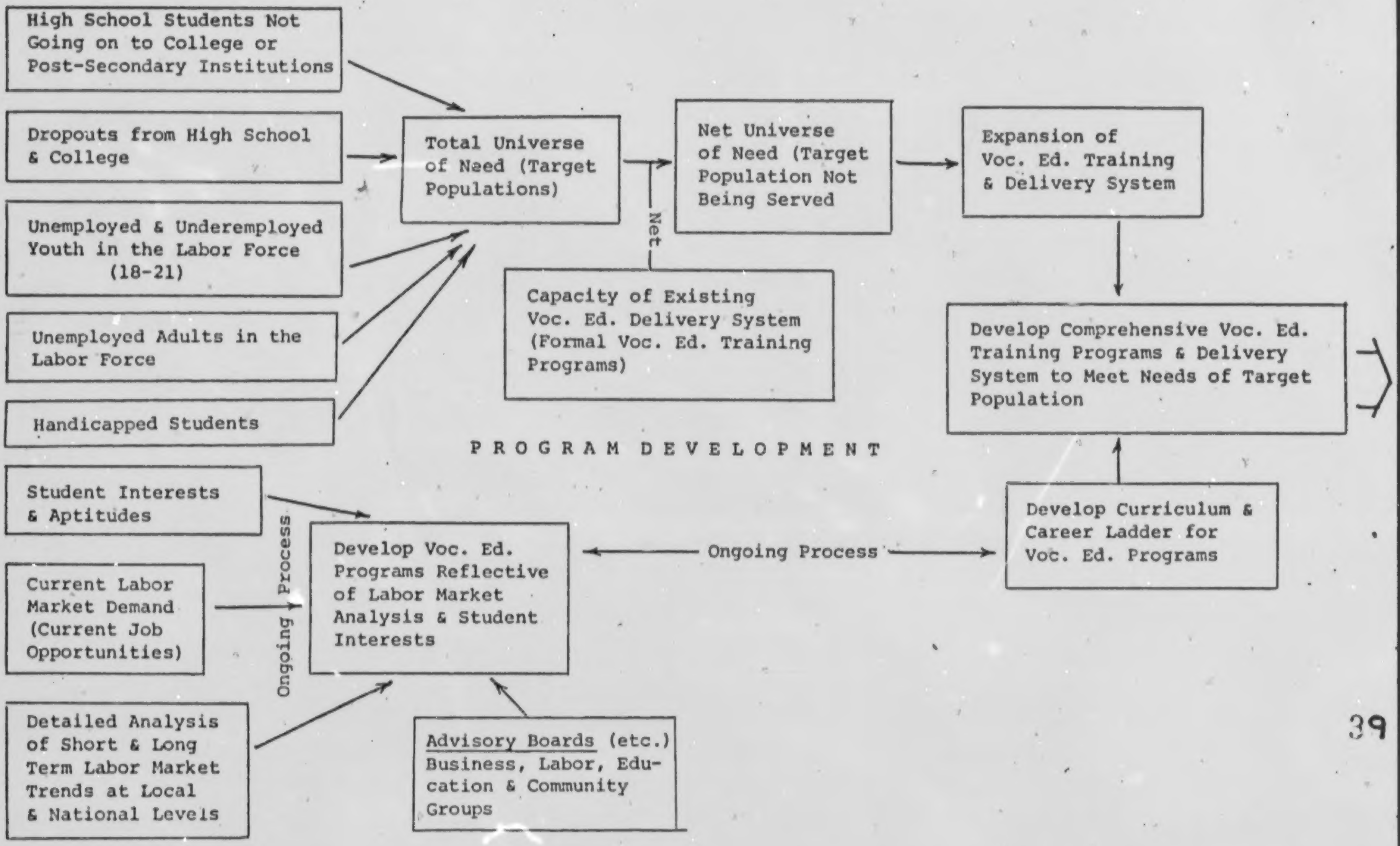
In the ensuing section of this report, the total "universe of need" for occupational training services for the target populations in the Bronx and New York City is defined and compared with the number of students and adults currently being serviced by the existing occupational education delivery system. Thus one can arrive at the "net demand" for occupational education training services in the two areas mentioned. (Cf. Figure 2.1.)

Assessment of need, however, is only one component of the process. The critical issue is how to develop an effective occupational education delivery system in the Bronx (and New York City) which can best fill that need. While the details of the development and implementation of an effective occupational education delivery system for the Bronx are dealt with in other chapters, this section (in addition to needs assessment) will focus on two other essential elements for implementation of an occupational education delivery system.

Specifically, an effective delivery system for occupational education must take into account (a) conditions and trends in the labor market (local, regional

Figure 2.1

UNIVERSE OF NEED


High School Students Not Going on to College or Post-Secondary Institutions
Dropouts from High School & College
Unemployed & Underemployed Youth in the Labor Force (18-21)
Unemployed Adults in the Labor Force
Handicapped Students
Total Universe of Need (Target Populations)
Net
Capacity of Existing Voc. Ed. Delivery System (Formal Voc. Ed. Training Programs)
Net Universe of Need (Target Population Not Being Served
Expansion of Voc. Ed. Training & Delivery System
Develop Comprehensive Voc. Ed. Training Programs & Delivery System to Meet Needs of Target Population
PROGRAM DEVELOPMENT
Student Interests & Aptitudes
Current Labor Market Demand (Current Job Opportunities)
Detailed Analysis of Short & Long Term Labor Market Trends at Local & National Levels
Ongoing Process
Develop Voc. Ed. Programs Reflective of Labor Market Analysis & Student Interests
Advisory Boards (etc.) Business, Labor, Education & Community Groups
Ongoing Process
Develop Curriculum & Career Ladder for Voc. Ed. Programs

and national), on the one hand, and (b) the needs and aspirations of students (and their parents), on the other. As will be shown in subsequent analyses to be found in this chapter, these two sets of conditions are far from being mutually compatible.

However, differences between the two may at least be reduced through improved management of economic and occupational information, and through increased availability and better use of information by all those involved in the decision-making process. The latter includes not only those who allocate resources in terms of occupational offerings, financial support and enrollment capacities, but also all those who are involved (or should be involved) in providing information, advice and guidance to students and out-of-school youth.

In addition, a need exists for a well-developed, ongoing process, at both the state and local levels, which would periodically bring together representatives of business, labor, governmental agencies and education, in order to: (1) review employment/economic forecasts; (2) assess current conditions in the labor market; and (3) provide qualifying information for occupational education planners and guidance counselors. Elements of such an ongoing monitoring system can be found in such organizations as the newly formed Bronx Occupational Education Advisory Commission, advisory groups involved with individual vocational education programs, CETA area manpower planning councils, and other related organizational units in the public and private sectors.

Improved decision making on program offerings and allocation of efforts, in terms of financial support and enrollment goals, requires development and application of more explicit criteria than those heretofore applied in the Bronx and New York City occupational/vocational education programs. In the final analysis, occupational education program planning cannot be determined by applying slide-rule formulas to statistics on labor market demand and supply, no matter how accurate the statistics may be. Program planning involves value choices, which are best made when drawing broadly upon a range of informed judgments of individuals concerned with the future of youth and of society.

All such critical information and judgments must eventually be assembled in such a way that will both efficiently and effectively assist the individual student and his advisors (teachers, parents, etc.). This requires a comprehensive occupational information system, as called for in Chapter Five ("Conclusions and Recommendations"), as well as the restructuring of career and vocational guidance (also recommended in Chapter Five).

This chapter, then, will provide the essential background information necessary for the formulation of a comprehensive occupational education delivery system for the Bronx and for New York City.

2.2 THE SECONDARY SCHOOL AGE POPULATION

2.2.1 Universe of Need

In the broadest of terms, the target population for occupational/vocational education training includes all those persons in need of skills training, either to obtain employment[1] or to upgrade skills in order to move out of the ranks of the underemployed.[2]

Thus a comprehensive needs assessment must take into consideration adults as well as the secondary school age populations in need of occupational training. However, recognizing the limited resources of the City's public school system and its primary obligation to the school-age population, the following analysis will focus primarily on the secondary school age population in need of occupational training, while outlining within a broader framework the needs of the relevant adult population.

* * * * *

According to New York City's philosophy on career and occupational education, "Every student should have a skill, even if planning for college."[3] This implies a universe of need for occupational education which encompasses all high school students (public and private), as well as those youth (16-19) who are out of school and unemployed. The total population aged 15-19[4] in New York City is 624,000 (of which 125,000 reside in the Bronx), minus those who are employed (120,000 in New York City; 24,000 in the Bronx), for a net total of over 500,000 in need of occupational training in New York City (100,000 in the Bronx).[5]

However, given the limited resources of New York City's educational programs, as discussed earlier, all those included within such a broad definition of the secondary school age population in need of occupational training could not realistically be serviced. Therefore, for purposes of this analysis, the definition of the secondary age target population has been narrowed to those who warrant the highest priority.[6] They include:

(1) students currently in school who will not go on to a post-secondary educational institution;

(2) students who will not complete their post-secondary programs;

(3) handicapped students, aged 14+ (but not including adults); and

(4) out-of-school youth (ages 16-19) in the labor force who are unemployed.[7]

Not included in this definition of the target population are the out-of-school youth[8] who were not in the labor force. This is due to a lack of information sufficient to determine the training needs of this group. However, it is obvious that a large number within this group are probably in need of occupational training.

* * * * *

New York City has a total secondary school population of 379,000 (as of Fall 1976), with an estimated 323,000 (grades 9-12, including special education)[9] in the public secondary schools and approximately 56,000 in non-public secondary schools (grades 10-12).[10] [The Bronx has a public secondary school enrollment of 58,500 (grades 9-12), and a non-public school enrollment of 12,300 (grades 10-12), for a total secondary school enrollment of 70,800, or approximately 18.6% of the total New York City secondary school population.] These populations are further defined in the following sections.

2.2.1.1 In-School Populations

i. Students not continuing at post-secondary institutions

Of the 379,000 high school students (grades 9-12) currently enrolled in New York City's public and private schools, approximately 231,500 (61%) will not receive any formal educational training beyond high school. In addition, of these 231,500 students, it is estimated that approximately 133,000 (combined total for a four-year period) will not even receive a high school diploma.

For the Bronx, it is estimated that of 70,800 high school students, 43,200 (61%) will not advance beyond high school for additional training; of this group, an estimated 25,000 will not complete high school (cumulative total for four years).

Students not continuing beyond high school for formal educational training constitute the single largest (and one of the highest priority) groups in calculating the total universe of need for the secondary school age target population. Unfortunately, it is not due to a lack of interest or desire on the part of many of the students that they do not receive occupational training, but rather because of the insufficient capacity of the existing occupational education delivery system in New York City (and the Bronx). The vocational high schools in New York City already operate at over 100% of capacity, and yet each year for the past several years, some 10,000 students could not be accommodated at these schools.

ii. Post-Secondary Dropouts

Of the 246,000 students currently enrolled in New York City's high schools who will receive their high school diploma, it is estimated that approximately 148,000 (60%) will enroll in post-secondary educational institutions. However, based on current survey data, approximately 59,200 (40%) of these students will not complete their post-secondary programs. (For the Bronx, approximately 11,000 post-secondary enrollees will drop out before completing their post-secondary programs.) While this group may be in a slightly better position for entry into the job market, having obtained their high school diploma and acquired some skills from their limited post-secondary training, they still lack sufficient occupational skills to compete in the job market. Thus the post-secondary dropout is usually underemployed (and often unemployed).

iii. Handicapped Students

The handicapped student population in New York City is just over 11,000, with 2,100 (19.4%) residing in the Bronx. These figures include only those handicapped students serviced by the Board of Education, either in high schools or in special facilities or programs operated by the Board. Not included are those handicapped persons outside the jurisdiction of the Board of Education.

While not a numerically large segment of the secondary school age target population, the occupational training needs of handicapped students are particularly acute. While many of the barriers to employment of handicapped persons have been removed in recent years, the handicapped person without occupational skills remains at a significant disadvantage in the labor market.

iv. Total In-School Population

Combining the three in-school target populations, we arrive at a total of roughly 302,000 students in need of occupational training services in the New York City school system, of which approximately 56,000 (18%) reside in the Bronx.

2.2.1.2 Out-of-School Populations

While the primary responsibility of the public education system is to service the needs of enrolled students, the public educational system cannot overlook the critical problems of out-of-school youth in the labor force. Disadvantaged by reason of age and educational background (the majority of out-of-school youth are dropouts), and lacking experience and occupational skills, 16-19 year-olds, more than any other group in the labor force, experience the most severe handicaps in competing for jobs. The unemployment rate for 16-19 year-olds in the labor force usually runs 2.5 to three times that for the City's labor force as a whole. For minority youth in the labor force, the unemployment rate runs five to six times the average.[11]

In 1975, the Bureau of Labor Statistics estimated that unemployment for 16-19 year-olds in the New York City labor force was well over 25%; for Black and Hispanic teenagers, the unemployment rates were over 50% and 65%, respectively.

It is estimated that, at present, there are over 40,000 youth in the New York City labor force who are unemployed. Of this total, approximately 8,000 (20%) reside in the Bronx. In addition, an even larger number of New York City youth are either underemployed or have dropped out of the labor force due to an inability to find work. This group, however, cannot be accounted for in this analysis of need due to an insufficiency of data.

While the City's manpower training programs under CETA do provide special training programs for unemployed out-of-school youth, only a small portion of these youth are presently being accommodated through such programs.

2.2.1.3 Total Universe of Need - Secondary Age Population

Combining the in-school and out-of-school populations in need of occupational training, one can identify the total "universe of need" for the secondary age target population in New York City as approximately 342,000, of which over 64,300 (18.8%) reside in the Bronx. The component elements of this total figure are presented in Table 2.1. (The reader is also referred to ATTACHMENT - B for a detailed description of the data gathering process employed relative to the needs assessment analysis.)

2.2.2 The Existing Delivery System - Secondary Level

Having defined the universe of need for the secondary school age population, the next step is to determine the extent to which the existing occupational education delivery system is serving this need. The difference between the universe of need and the capacity of the existing delivery system is the "net demand" for occupational education training.

Table 2.1

Universe of Need: Secondary School Age Population

	NYC	Bronx	Bronx %
In-School Population			
Students currently in school who will not continue at (enroll in) post-secondary educational institutions (including those who will not receive a high school diploma)	231,500	43,200	18.7
Students who will not complete their post-secondary program ("post-secondary dropouts")	59,200	11,000	18.6
Handicapped students age 14+ (not including adults)	11,000	2,100	19.4
SUBTOTAL	301,700	56,300	18.7%
Out-of-School Population			
Out-of-school youth (16-19) in labor force who are unemployed	40,000	8,000	20.0
TOTALS	341,744	64,346	18.8%

Since the primary function of an occupational education delivery system, as outlined in this report, is to increase the employment potential for secondary school age youth, the present evaluation of the existing delivery system has been limited to the high skill and vocational training programs which will provide students with occupational skills for entry-level jobs, or which will lead to advanced skills in a trade. Career awareness and exploration programs have been excluded, not because they are not valuable, but because they do not provide the student with the actual skills required for entry-level jobs.

Table 2.2 presents the number of students provided occupational training in New York City and the Bronx (Fall 1976). The numbers of students in academic and comprehensive high schools, and in non-public high schools, who receive high skill or occupational training are estimates, as data are only available on enrollments and many students are concurrently enrolled in several occupational courses. The same is also true of the dual enrollment programs, particularly the After School Occupational Skills Programs (ASOSP), which provides skills training after school and during the summer. Its students may be enrolled in an occupational program during the day and still take additional training, often in another area, in the ASOSP. Thus the corresponding figure, which accounts for nine of ten dual enrollment students, actually inflates the overall figures for the existing delivery system.

With this in mind, the overall total of secondary students being served in high skills and occupational programs in New York City can be estimated at 147,000 (22,500 in the Bronx).

Table 2.2

Existing Delivery System: Public School System, Secondary School Age Population

	NYC	Bronx	Bronx %
Students in vocational high schools (October 1976)	41,629	7,053	16.9
Students in academic and comprehensive high schools enrolled in "high-skill and occupational programs"	78,500	9,600	16.9
Handicapped students in secondary level occupational training programs	4,389	1,253	28.5
Non-public secondary students in occupational training programs	12,800	3,300	25.8
Students in dual enrollment programs	10,132	1,338	13.2
TOTALS	147,390	22,544	15.3%

2.2.2.1 The New York City Delivery System

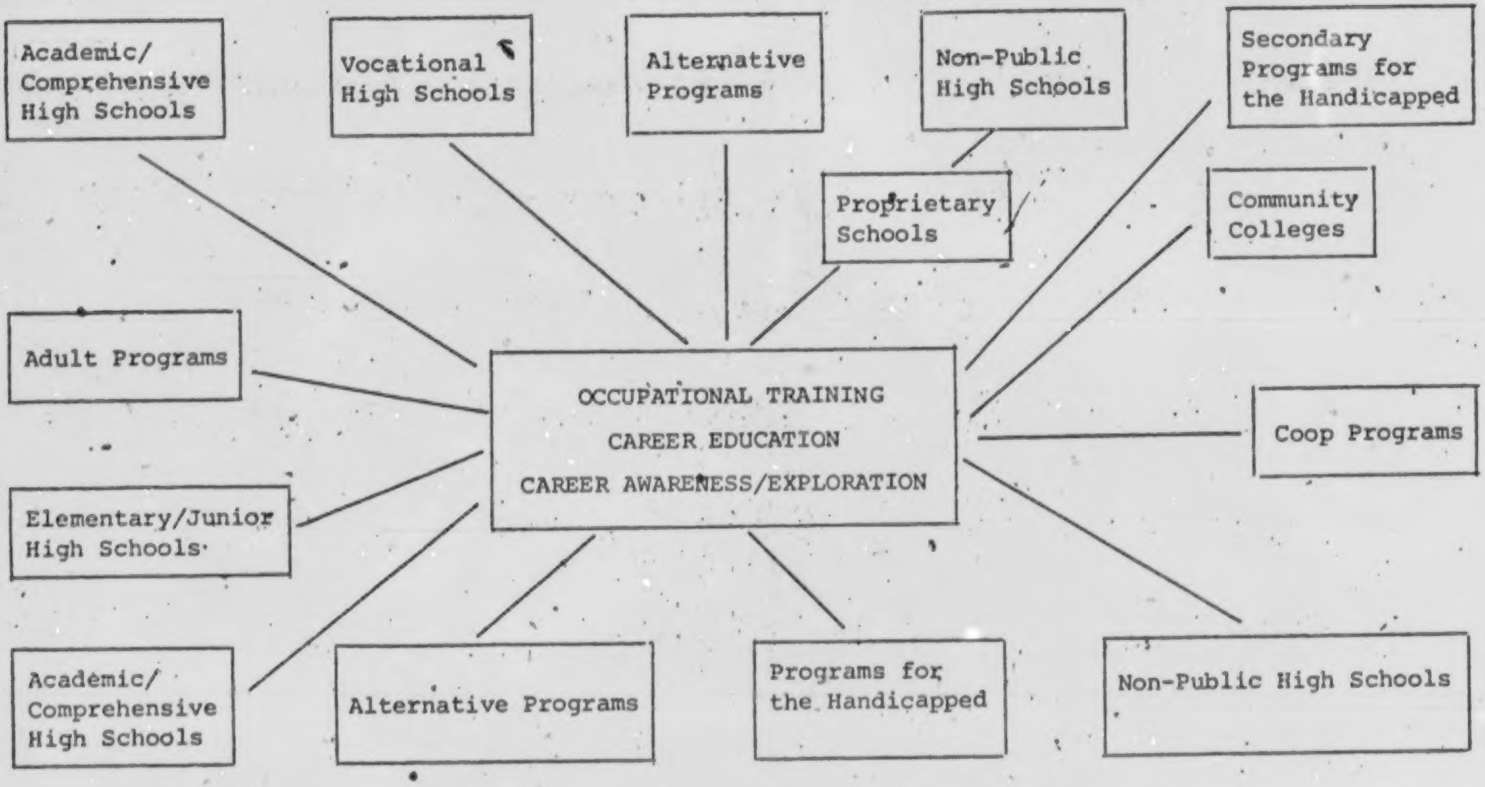
In 1976, 320,000 students were enrolled in New York City's public high school programs. They attended 60 academic, 16 comprehensive, 23 vocational and 11 alternative high schools. Approximately 45,000 (14.5%) of this total were enrolled in 23 vocational high schools, while 268,000 were enrolled in 73 academic/comprehensive high schools. The problem of providing occupational education to high school students in New York City is of enormous magnitude, as indicated by these figures.

In 1967, when the Board of Education made major changes with regard to the organization of high schools, occupational education was to be provided to secondary school students through a system of comprehensive high schools. This was to be accomplished by building 32 new comprehensive high schools. Eight to 13 vocational schools were also scheduled to be converted to comprehensive schools, and occupational education wings were to be added to 51 academic high schools by 1975. To date, however, only 12 high schools designated as comprehensive have been constructed. Of these, five have not been equipped with skilled trades shops and two have no provisions for high-skill occupational programs; none of the proposed occupational wings for existing high schools has been completed. This plan projected an enrollment of 125,000 in occupational programs by 1975. To date, however, there are only 35,000 students enrolled in same.

Other than the curtailed delivery components described above, the only other secondary school sources of entry-level occupational training are the dual enrollment programs (the After-School Occupational Skills Program and the Shared Instructional Service Program). (See Figure 2.2 for a representation of all sources, at the secondary level and otherwise.)

Figure 2.2

The Current Occupational Training* System in New York City
(including the Bronx)


Academic/ Comprehensive High Schools
Vocational High Schools
Alternative Programs
Non-Public High Schools
Secondary Programs for the Handicapped
Proprietary Schools
Community Colleges
Adult Programs
OCCUPATIONAL TRAINING
CAREER EDUCATION
CAREER AWARENESS/EXPLORATION
Coop Programs
Elementary/Junior High Schools
Academic/ Comprehensive High Schools
Alternative Programs
Programs for the Handicapped
Non-Public High Schools

*Occupational training is defined as a program requiring 10 periods/week or more of student participation.

Shared Instructional Services Program. This program provides high-skilled occupational training for students attending academic and comprehensive high schools. These students have identified occupational interests but, for various reasons, cannot be accommodated in any of the 23 vocational schools. Students participating in this program attend vocational schools located within reasonable traveling distances as part of their educational program, and receive credit for their training. Over 1,200 students are currently participating in this program.

After-School Occupational Skills Program. This program involves students who attend classes on a voluntary basis twice weekly, after school hours, in addition to their regular programs. The program utilizes modular units of instruction, such that completion of several units is designed to train the student for an entry-level job.

2.2.2.2 The Bronx Delivery System

The total enrollment in Bronx high schools as of October 31, 1976 was 50,460 for the 12 academic comprehensive high schools, and 7,040 for the four vocational high schools. In general, other than in the four vocational schools (presently operating at 101% of capacity and denying admission to over 40% of their applicants), there is limited opportunity for students to receive high-skill occupational training. Of those courses available in the academic comprehensive schools (operating at less than 86% of capacity), only the business and distributive education areas offer a broad spectrum of programs of high-skill training for entry-level work (and this varies from school to school, depending upon facilities).

While a wide variety of occupational courses are offered in the academic/comprehensive high schools, as a whole they are very limited in any one school. A total of 63 different occupational courses are offered in the Bronx high schools; however, in any one school the range of offerings varies from a low of six to a high of 20. Typing is the only occupational course offered in all of the academic/comprehensive high schools. Of the 63 courses, 34 (54%) are offered in only one school. Students are generally limited to those courses offered in their home school, with a few additional options available through the After School Occupational Skills Training Program and the Shared Instruction Program. Thus the full range of occupational course offerings is not available to any one student.

It is clear that, although a sizable proportion of the school population is participating in pre-vocational or exploratory programs (industrial arts, home economics, business and distributive education programs), these only serve to introduce students to tools, machinery, methods, and processes related to a wide variety of careers. These programs leave students with a sound basis for making informed career choices, but after taking these courses, it is frequently not possible for students to participate in any systematic program of skills training which would provide them with specific competencies necessary for a specific entry-level job.

Thus it is seen that even though there are occupational training programs available to students, they are restricted primarily to those students attending vocational high schools and those participating in the Shared Instructional Services Program or the After-School Occupational Skills Program. This limitation of the availability of occupational training programs is due to the following factors:

- Students must choose a vocational school prior to the end of 8th or 9th grade (after being exposed to exploratory programs) in order to attend same in 10th or 11th grade; they are precluded from attending vocational schools at a later time.
- There exists a lack of high-skill occupational facilities in academic comprehensive high schools.
- The inaccessability of vocational high schools to most of the students in the Bronx precludes access by many students who would otherwise participate through the Shared Instructional Service and After-School Occupational Skills Programs.
- Some potential students may not participate due to the necessity of taking mandated remedial programs (e.g., all students reading two years or more below grade level must take these remedial programs). Students receiving remedial instruction do not have time to participate in occupational training programs.
- There exists no uniform exploratory program.

In addition to the above, fiscal factors contribute to the system's difficulties in meeting the many and varied needs of the city.

2.2.3 Net Demand for Occupational Education - Secondary School Age Population

Comparing the universe of need for the secondary school age population with the capacity of the existing delivery system, we see that there exists a serious shortfall in the latter, i.e., a "net demand" for occupational education training in New York City, and particularly in the Bronx.

In contrast to a total universe of need for New York City's secondary age population of 341,700, the existing delivery system currently serves 147,400 youth, or approximately 43% of current need. In other words, over 194,000 of the secondary school target population in need of occupational training are not being serviced at the present time.

In the Bronx, the shortfall is even more pronounced. With a total universe of need for the secondary age target population of 64,300 (18.8% of the New York City total), only 22,500 students are currently enrolled in occupational or vocational education programs (or approximately 15.3% of New York City's total occupational/vocational education enrollments). That is, only 35% (compared with 43% for New York as a whole) of the Bronx secondary school age population in need of occupational training are currently being serviced, leaving a shortfall or net demand of 41,800 Bronx youth in need of such training. (See Table 2.3 for a summary of net demand, and the Attachments for details on enrollments.)

Table 2.3

Net Demand for Occupational Education, Secondary Age Population

	NYC	Bronx	Bronx %
Universe of Need	341,700*	64,300	18.8
Existing Delivery System	147,400	22,500	15.3
(%age of Need Serviced)	(43.1)	(35.0)	-
NET DEMAND	194,300	41,800	21.5%

*All figures rounded to the nearest hundred.

2.3 THE ADULT POPULATION

2.3.1 Universe of Need

The New York State Department of Labor estimates that some 1,420,000 adults (age 16+) will require employment-related services during FY'77.[12] It was further estimated that of this total, 174,000 (12%) reside in the Bronx. These figures represent the total number of individuals who may need such services. They may be further broken down into two major categories, namely the:

Unemployed, i.e. all unemployed persons (It is assumed that all persons who are unemployed, even if for very short periods of time, require employment-related services.)

Underutilized, i.e.:

- persons working full-time but with earnings which do not raise their family income above the near-poverty level;[13]
- persons working part-time (less than 35 hours per week) for economic reasons (unavailability of full-time work); and
- persons classified as "not in the labor force but should be," assuming the removal of their barriers to employment.

Of these 1,420,000 persons, almost 823,000 (59%) are minority group members. Almost one in five persons meets the criteria for being disadvantaged.[14] Of the nearly 295,000 disadvantaged, just over 39,000 are unemployed and over 255,000 are "underutilized" (the majority of these -- 172,000 -- are "not in the labor force but should be). The remainder (some 83,000) were employed either part-time or full-time.

Those employed full-time (just over 49,000) had income at or below the poverty level.[15] Those employed only part-time (some 34,000) were underutilized for economic reasons, such as lack of full-time work.

Of the total number of persons in need of employment-related services, 45.7% fall into the underutilized category (the remainder being unemployed). The majority of the underutilized are persons categorized as "not in the labor force but should be" (over 344,000 individuals). This group is in particular need of occupational training, since they are not in the labor force due to barriers to employment.[16] If the barriers were removed they would enter the labor force.

All of the above figures apply to New York City as a whole. There are no comparable figures for the adult population in the Bronx, with the exception of figures for the unemployment rate. The Bronx had an unemployment rate of 10.7%, as compared to a nearly equal rate for the city as a whole (10.6%). Of a total labor force of 515,100 in the Bronx, 55,100 (10.7%) was the average annual number of unemployed for 1975.[17]

In estimating the number of underutilized persons in the Bronx, since no specific data were available, we assumed that the rate of underutilization would be the same as for the city as a whole. While this may not yield a definitive figure, it does provide an idea of the magnitude of the problem in the Bronx. (In all probability, the resultant figure will be a low estimate. This is due to the fact that the Bronx has a higher percentage of minorities than any of the other boroughs of the city, since minorities accounted for the majority of the universe of need for the overall city -- 59%.)

Given these assumptions, the underutilized population in the Bronx would be 18.4% of the underutilized population of New York City.[18] This results in an underutilized population of some 120,000 in the Bronx. No attempt will be made to break this figure down further, since it is only an estimate which is based on an assumption made necessary by the lack of data on the Bronx.

Table 2.4

Adult Population in Need of Employment-Related Services - The Bronx

Unemployed	55,000
Underutilized	120,000
Total	175,000

Since the State Department of Labor's figures include those in need of any employment-related services, and since we are primarily concerned with occupational training, certain adjustments are required. Likewise, we must consider that out-of-school youth (ages 16-19) are included in the figures developed above, as well as under the secondary-age population dealt with in section 2.2

The State Department of Labor estimates that 770,000 persons will be unemployed at some time during FY'77. For purposes of this study, it was assumed that half of those identified as unemployed require occupational training,[19] the other half requiring only assistance in obtaining employment. Based on this assumption, some 335,000 unemployed adults will be in need of occupational training (of which 27,500 reside in the Bronx). Of these 335,000 unemployed adults (ages 19+), 40,000 have been accounted for in the secondary-age population (8,000 of which reside in the Bronx). Thus we arrive at an unemployed adult population in need of occupational training of 295,000 for New York City, and 19,500 for the Bronx.

It was also assumed that the entire underutilized population requires occupational training. That population is estimated to be 649,000 in New York City, the majority of which are "not in the labor force." Of these, some 119,000 are estimated to reside in the Bronx.

The combined total of the adjusted unemployed and underutilized populations is 944,000 in New York City and 138,000 in the Bronx.

Table 2.5

Total Universe of Need
for Occupational Training

	New York City	Bronx
50% of unemployed (minus 16-19 year olds)	295,000	19,500
underutilized	649,000	119,000
total universe of need	944,000	138,500

2.3.2 Existing Delivery System

The existing delivery system for adult occupational education may be divided into four component parts: Board of Education programs, colleges, CETA Title I programs, and private training institutions. The breakdown and totals for New York City and the Bronx are as follows.

Table 2.6

Existing Delivery Capacity

	NYC	Bronx	Bronx %
Board of Education programs	65,722	3,724	5.6
Community colleges (CUNY)	32,207	6,963	19.2
(SUNY)	4,026	-	
CETA Title I	25,951	-	
Private institutions	15,000	300	2.0
Totals	142,906	10,987	7.6%

2.3.3 Net Demand for Occupational Education - Adult Population

The net demand for occupational training for adults is, as previously, the difference between the universe of need and the number accommodated by the existing delivery system. The net demand for the adult population in New York City is 801,000; the figure for the Bronx is 127,500.

Table 2.7

Net Demand for Occupational Training - Adult Population

	NYC	Bronx	Bronx %
universe of need	944,000	138,500	14.7
existing capacity	142,900	11,000	7.7
net demand	801,000	127,500	15.9%

2.4 SUMMARY: TOTAL DEMAND FOR OCCUPATIONAL EDUCATION

To assess the need for occupational training in New York City and the Bronx, we compared the universe of need for occupational education training among the target populations (secondary school age and adult populations) with the numbers of persons in those target populations currently being serviced by the occupational education delivery system. The shortfall constitutes the net demand for occupational training.

For the secondary school age population, we focused on four priority target groups:

- high school students who will not go on to post-secondary training;
- post-secondary dropouts;
- handicapped youth; and
- out-of-school youth in the labor force who are unemployed.

It is estimated that the current universe of need for these four secondary school age target groups is 341,700 for New York City as a whole, with 64,300 (18.8%) residing in the Bronx. The existing occupational education delivery system in New York City, however, services only 147,400 (approximately 43%) of this need. In the Bronx, 22,500 youth out of 64,300 (only 35%) are currently being serviced by the existing delivery system for occupational education.

Thus the net demand for occupational education totals over 194,000 among New York City secondary school age target populations. In the Bronx, nearly 42,000 secondary age youth are not being serviced.

Among the adult population, the universe of need was 944,000 for New York City, with 138,000 of these adults residing in the Bronx. The existing delivery system services roughly 143,000, or 13.8%, of these adults in New York City as a whole, but only 11,000 (7.7%) of the adults in the Bronx. Thus the current net demand for occupational education among New York City adults is approximately 801,000, with 127,500 of these persons residing in the Bronx.

Combining the net demand figures for the secondary age and adult populations, we arrive at a total net demand for occupational education training of 995,400 in New York City, with 169,300 (17%) of this total net demand concentrated in the Bronx. (See Table 2.8 for a summary of these figures.)

Table 2.8

Net Demand for Occupational Training

	NYC	Bronx	Bronx %
Universe of Need			
Secondary School Age	341,700	64,300	18.8
Adults	944,000	138,500	14.7
Totals	1,285,700	202,800	15.8
Existing Delivery Capacity			
Secondary School Age	147,400	22,500	15.3
Adults	142,900	11,000	7.7
Totals	290,300	33,500	11.5
Net Demand	995,400	169,300	17.0%
Percentage of Need Not Being Serviced	77.4%	83.5%	

2.5 THE NEED AS DETERMINED THROUGH LABOR MARKET ANALYSIS

Young people face the difficult task of choosing sound career plans among thousands of alternatives. As the economy continues to expand, creating many new kinds of jobs, this planning becomes even more difficult.

Many questions are important to young persons as they attempt to match their abilities and interests with a myriad of occupational choices.

- What fields look promising for employment opportunities?
- What education and/or training is required to enter a particular occupational field?
- How do various occupations requiring similar training compare in terms of earnings?
- Which types of employers provide which kinds of jobs?
- Does employment in a particular job mean steady year-round work or is the job seasonal?

The answers to these questions change with economic growth. New goods/services and improved methods of production, as well as change in living standards, life styles, and government policy, constantly alter the types of jobs which become available.

To have an "effective" vocational education delivery system which can respond to the needs of the student in making his career decisions, and which can provide the appropriate occupational training, it is essential that vocational planners and counselors perform systematic and comprehensive evaluations of manpower trends and job market opportunities. In analyzing same, it is important to consider not only current demands in the labor market, but also longer-term prospects (3-5 years) for employment growth. Training for today's jobs without insight into tomorrow's opportunities constitutes a serious misdirection of resources, for both the student and the educational system.

Furthermore, an effective manpower and labor market monitoring system must consider not only the trends in the local labor market, but also occupational growth patterns at the national and regional levels. Employment trends at the national level will exert direct influence upon local economic trends. They they must be taken into consideration for evaluating potential inter-labor-market mobility for the trained, career-oriented young adult.

* * * * *

This section of the report will provide an analysis of recent and projected employment trends at the national and local levels, as well as the implications of these trends for career education and vocational training. No one can forecast the future with certainty, particularly when attempting to foresee long-range employment opportunities. Nevertheless, by using the wealth of information available, and through the processes of economic and statistical analysis, the future can be broadly sketched. And of more immediate significance for our present purposes, we can also establish a framework or process by which vocational planners and counselors in the Bronx can develop an ongoing system for monitoring manpower and labor market trends, as they pertain to vocational and occupational training.

To simplify the presentation of our labor market/ manpower analysis, we have divided the section into three parts. Section 2.5.1 deals with national employment trends and outlines recent employment developments (with projections up to 1985). The general trends in the national labor market are summarized in the body of the report, while a more detailed analysis of projected employment growth for some 241 occupations (identified by Voc Ed and HEGIS codes) is presented in ATTACHMENT D

Section 2.5.2 provides a more in-depth analysis of employment and manpower trends and projections (to 1980) for the local (New York City and the Bronx) labor markets. This analysis was prepared through three extensive labor market surveys, undertaken by the Educational Planning Institute. The basic findings of the EPI surveys are summarized in the body of the report, with more detailed information provided in ATTACHMENT E.

Finally, section 2.5.3 outlines the process and sources utilized in undertaking the manpower analyses. In addition, a detailed bibliography of some of the more important manpower data sources is provided in ATTACHMENT F.

2.5.1 Employment Trends at the National Level

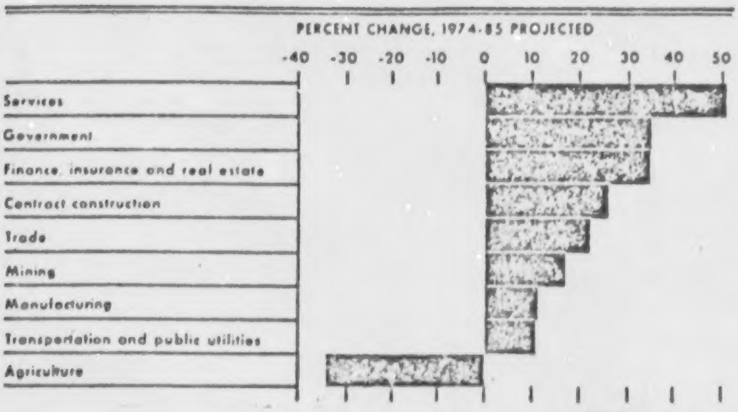
2.5.1.1 Growth Trends by Class of Industry[20]

In general, job growth through the mid-1980's is expected to continue to be more rapid in the service-producing industries than in the goods-producing industries. However, among industry divisions within both the goods-producing and service-producing areas, the growth pattern will continue to vary (see Figure 2.3).

Service Producing Industries

In 1974, about 53.7 million workers were on the payrolls of service-producing industries (trade, government, "services and miscellaneous," transportation and utilities, finance/insurance/real estate) -- about 19.8 million more than the number employed in 1960. The major factors underlying this rapid growth were (a) population growth, (b) increasing urbanization with its accompanying need for more city services, and (c) rising incomes and living standards accompanying a demand for improved services, such as health and education. These factors are expected to continue to result in rapid growth of service industries as a group, and they are expected to employ 71.5 million by 1985, an increase of roughly 33% over the 1974 level.

Trade, the largest division within the service-producing industries, has expanded sharply since 1960. Wholesale and retail outlets have multiplied in large and small cities to satisfy the needs of our highly urban society. Employment in trade



Source: Bureau of Labor Statistics

Figure 2.3: Employment Growth, by Industry, through the Mid-1980's

reached some 17 million in 1974, roughly 49% above the 1960 level.

Employment in trade is expected to grow by some 22 percent between 1974 and 1985. Although an ever-increasing volume of merchandise will be distributed as a result of increases in population and consumer expenditures, the rate of increase in manpower needs will be slowed by labor-saving technology, such as the greater use of electronic data processing equipment and automated warehousing equipment, and by growth in the number of self-service stores and vending machines.

Government employment has grown faster than any other division, increasing by approximately 70% (from 8.4 million to 14.5 million) between 1960 and 1974. This growth has been mostly at the state and local levels, which together expanded by 90%. Employment growth has been greatest in agencies providing education, health, sanitation, welfare, and protective services. Federal government employment increased by some 20% between 1960 and 1974.

Government will continue as a major source of new jobs through the mid-1980's. Employment in government will grow faster than the average for other industries, rising some 35% over the 1974 total. Most of this growth will occur in state and local agencies. At the federal level, employment will grow more slowly than the average rate.

Service and miscellaneous industries have increased rapidly as a result of the growing need for health services, maintenance and repair, advertising and domestic help. From 1960 to 1974, total employment in this industry division rose by over 80%, from 7.4 million to some 13.5 million.

Service and miscellaneous industries will continue to be among the fastest-growing industries through the mid-1980's. More than half again as many workers are expected to be employed in this industry division in 1985 as in 1974. Manpower requirements in health services are expected to grow rapidly due to population growth and the increasing ability of persons to pay for health care. Business services, including accounting, data processing and maintenance, are also expected to grow rapidly.

Transportation and public utility employment in 1974 (4.7 million) was roughly 17% higher than in 1960. However, different sectors of this industry have experienced different growth trends. For example, employment increased rapidly in air transportation, but declined in the railroad industry.

The number of jobs in transportation and public utilities as a whole is expected to increase by 11% by 1985 -- less than the average for other industries. Widely differing employment trends will continue to prevail among individual industries within this division. Continued increases in employment are expected in air transportation, and a decline is expected to continue in railroad employment. A slight decline is expected in water transportation.

Finance, insurance and real estate, the smallest of the service-producing divisions, grew by roughly 56% (to more than 4.1 million) between 1960 and 1974. Employment has grown especially rapidly in banks, in credit agencies, and among security and commodity brokers, dealers, exchanges, and services.

Job growth in finance, insurance, and real estate will outpace the overall increases in non-farm employment through the mid-1980's. Employment in 1985 will be roughly 35% higher than in 1974.

Goods-Producing Industries

Employment in the goods-producing industries (agriculture, manufacturing, construction, mining) -- at more than 28.1 million in 1974 -- has increased slowly in recent years. Significant gains in productivity resulting from automation and other technological developments, as well as the growing skills of the work force, have permitted large increases in output without corresponding increases in employment. Overall, employment in goods-producing industries is expected to increase more slowly than the average for other industries. However, widely divergent patterns of employment changes have occurred and will continue among the industry divisions in the goods-producing sector.

Agriculture, which until the late 1800's employed more than half of all workers in the economy, employed about 4% (3.5 million workers) in 1974. Increases in the average size of farms, rapid mechanization, and improved fertilizers, feeds, and pesticides, have created large increases in output, even though employment has fallen sharply.

On the other hand, the worldwide demand for food is increasing rapidly. Although farm employment in 1985 will fall below the 1974 level, the rate of decline will be slower than during the 1960's.

Mining employment, at about 672,000 workers in 1974, has declined nearly 6% since 1960, due primarily to labor-saving technological changes. The overall trend is expected to change, and mining employment in 1985 should be roughly 17% higher than in 1974. Coal mining will be a major source of new jobs, as the cost of other fuels continues to rise and efficient ways are found to minimize the environmental impact of mining.

Contract construction employment (some 4 million in 1974) has increased by approximately 38% since 1960, as a result of the nation's growing need for homes, apartments, offices, stores, highways, and other physical facilities.

Between 1974 and 1985, employment in contract construction is expected to grow about as fast as the average for other industries, rising by 26%.

Manufacturing, the largest division within the goods-producing sector, employed some 20 million workers in 1974 (an increase of some 19% over 1960). New products for industrial and consumer markets, and the rapid growth of government expenditures for defense and space programs, spearheaded growth during the 1960's.

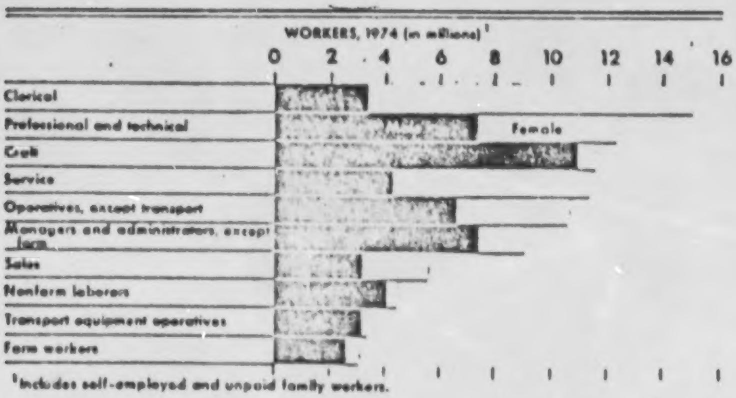
Manufacturing employment is expected to increase more slowly than the average for other industries through the mid-1980's, reaching some 22.2 million in 1985. Employment in durable goods manufacturing is projected to increase at a slightly faster rate than total manufacturing, and non-durable goods, somewhat more slowly. However, the growth rate will vary among the individual manufacturing industries.

2.5.1.2 Growth Trends by Occupation

As industries continue to grow, change will take place in the nation's occupational structure. Jobs will become more complex and specialized, offering an even greater number of occupational choices to persons planning a career. By first studying the outlook for broad occupational groups, the task of identifying trends for specific occupations becomes more manageable (see Figure 2.4).

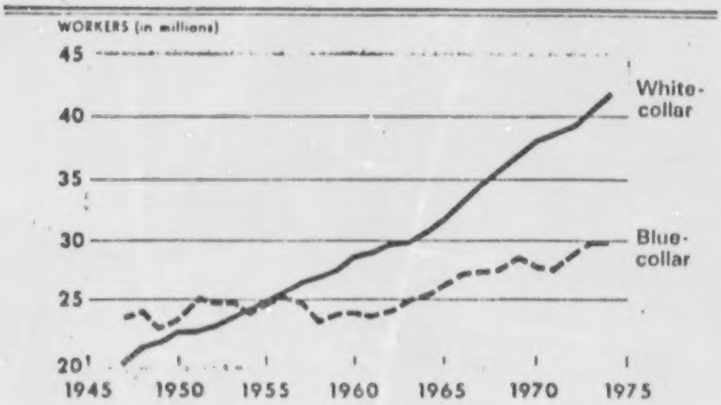
Among the broad occupational groups, white collar jobs have grown most rapidly. In 1974, white collar workers (professional, managerial, clerical and sales) outnumbered blue collar workers (craftworkers, operatives, laborers) by almost 12 million (see Figure 2.5).

Through the mid-1980's, we can expect a continuation of the rapid growth in white collar and service occupations, a slower than average growth in blue collar occupations, and a further decline in farm workers. The rapid growth expected for white collar and service workers reflects continuous expansion of the service-producing industries, which employ a



Source: Bureau of Labor Statistics

Figure 2.4: Employment by Major Occupational Group



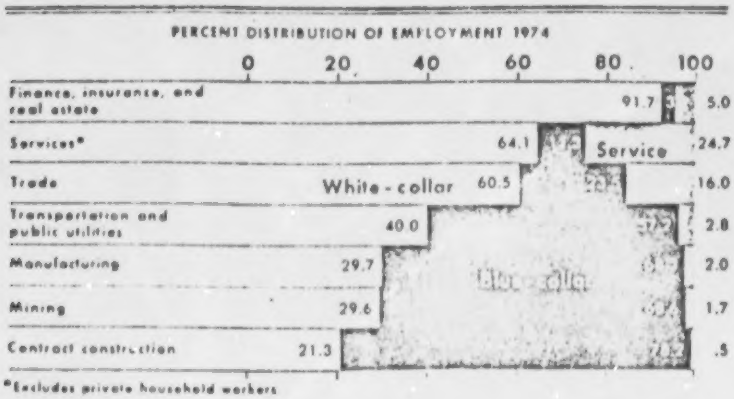
Source: Bureau of Labor Statistics

Figure 2.5: Shift in Employment Toward White-Collar Jobs

relatively large proportion of these workers. The growing demand for workers to perform research and development, to provide education and health services, and to process the increasing volumes of paperwork throughout all types of enterprises, will also be significant in the growth of white collar jobs. The slower than average growth in the number of blue collar and farm workers reflects the expanding use of labor-saving equipment and the relatively slow growth of the goods-producing industries which employ large proportions of blue collar workers (see Figure 2.6).

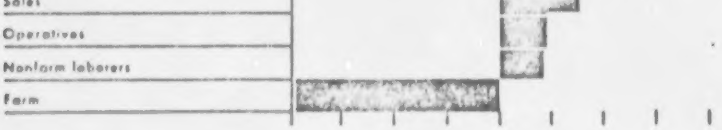
The following pages describe in greater detail the changes expected to occur among broad occupational groups through the mid-1980's.

Professional and technical workers comprised the third largest occupational group in 1974 (12.3 million) including such highly trained personnel as teachers, dentists, accountants, and clergy. Professional occupations will grow by about 30% between 1974 and 1985, second only to clerical occupations in terms of growth rate (see Figure 2.7). Professional workers in this area will be in great demand as the nation makes greater efforts in the areas of transportation, energy production, rebuilding of cities, and enhancing the beauty of the land. The quest for scientific and technical knowledge is bound to grow, raising the demand for workers in scientific and technical specialties. The late 1970's and early 1980's will witness a continuing emphasis on the social sciences and medical services.



Source: Bureau of Labor Statistics

Figure 2.6: Utilization of Worker Categories, by Industry



Source: Bureau of Labor Statistics

Figure 2.7: Employment Growth through the Mid-1980's, by Occupation

Managers and administrators totaled approximately 8.9 million in 1974. As in the past, requirements for salaried managers are likely to continue to increase rapidly because of the growing dependence of business organizations and government agencies on management specialists. On the other hand, the number of self-employed managers is expected to continue to decline, as the trend toward larger businesses continues to restrict growth in the total number of firms, and as supermarkets continue to replace small groceries and general stores. Overall, the number of managers will increase by roughly the same rate as the average for other occupations.

Clerical workers made up the largest group of workers in 1974 (15 million). They are expected to be the fastest growing group during the 1974-1985 period, increasing by about one-third. Included in this category are workers who operate computers and office machines, who keep records, take dictation, and type. Many new clerical positions are expected to open up as industries employing large numbers of clerical workers continue to expand. The demand will be strong for those qualified to handle jobs created by electronic data processing operations.

Sales workers, accounting for some 5.4 million persons in 1974, are found primarily in retail stores, manufacturing and wholesale firms, insurance companies, and real estate agencies, as well as companies offering goods door-to-door. Sales workers are expected to increase by roughly 16% between 1974 and 1985. Sales worker employment will grow as population growth and business expansion increase the demand for a wide range of goods and services.

Craft workers, numbering about 11.5 million in 1974, include a wide variety of occupations such as carpenters, tool and diemakers, instrument makers, all-round machinists, electricians, and typesetters. Industrial growth and increasing business activity will spur the growth of craft occupations through the mid-1980's. However, technological developments will tend to limit the expansion of this group. Employment for craft workers is expected to increase about as fast as the average for all occupations, rising to nearly 20% by 1985.

Operatives made up the second largest group among the major occupations in 1974, with about 13.9 million workers engaged in such activities as assembling goods in factories, driving trucks, buses and taxis, and operating machinery.

Employment of operatives is expected to increase by some 9% by 1985 (a slower rate than the average for other occupations). Technological advances will reduce employment for some types of semi-skilled occupations. Increases in production, as well as the trend toward motor truck transportation of freight, are expected to be major factors contributing to the overall employment increase.

Laborers (excluding those in farming and mining) numbered nearly 4.4 million workers in 1974. They move, lift, and carry materials and tools in the nation's places. Employment of laborers is expected to increase by only some 9% between 1974 and 1985, despite increased activity in manufacturing and construction, where most are employed. Increased demand is expected to be offset by rising productivity, resulting from continued substitution of mechanical equipment for manual labor.

Service workers (including men and women who maintain law and order, assist professional nurses in hospitals, give haircuts and beauty treatments, serve food, and clear and care for homes) totaled roughly 11.4 million in 1974. This diverse group is expected to increase by 28% between 1974 and 1985. Some of the main factors expected to increase requirements for these occupations include the rising demand for hospital and other medical care, the greater need for protective services as urbanization continues and cities become more crowded, and the more frequent use of restaurants, beauty salons, and other services, as income levels rise and an increasing number of housewives take jobs outside the home.

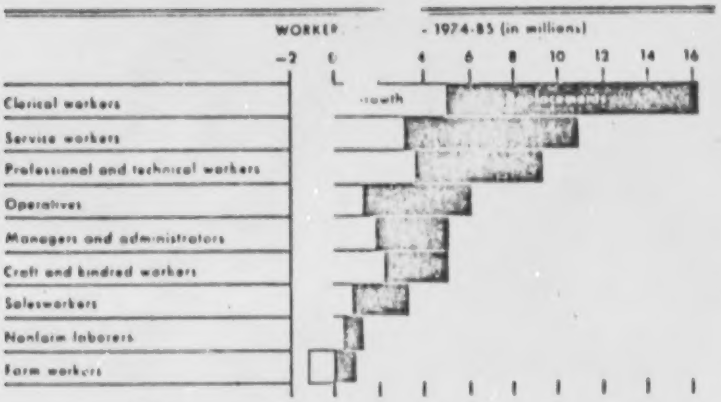
The employment of private household workers, however, will continue to fall, despite a rise in demand for their services. Fewer persons will accept household employment due to low wages and the strenuous nature of the work.

Farm workers (including farmers, farm managers, laborers, and supervisors) numbered nearly 3.1 million in 1974. The demand for food products, both at home and for export, will continue to grow rapidly. Farm employment, however, will decline through the mid-1980's as farm technology continues to improve.

A Note on Choosing an Occupation

In considering careers, young people should not eliminate an occupation merely because it will not be among the fastest growing. Although growth is an indicator of future job outlook, it is not the only factor. More jobs will be created between 1974 and 1985 from deaths, retirements and other labor force separations than from employment growth. (See Figure 2.8.) Replacement needs will be particularly significant in occupations which have a large proportion of older workers.

Furthermore, an occupation with many workers, even though it may have little prospect for growth, may offer more openings than a fast-growing, small one. For example, openings for operatives resulting from both growth and replacement needs will be greater than for craftsmen, although the rate of growth in the employment of craftsmen will be considerably more rapid than the rate of growth for operatives.



Source: Bureau of Labor Statistics

Figure 2.8: Projected Job Openings due to Growth and Replacement

2.5.2 Employment Trends in New York City

2.5.2.1 General Trends

There are two recent developments which can be expected to affect employment trends within New York City: (a) a steady decline of the overall City economy, particularly in manufacturing and construction, and (b) an increasing shift in the composition of the labor market, from blue to white collar employment (which is also characteristic of the nation as a whole). Obviously, these two trends play into and reinforce one another, as indicated in Eli Ginzburg's An Economic Development Agenda for New York City. If present trends continue, then, the job market can be expected to remain "tight," and those non-college jobs (i.e., jobs not requiring a college degree) which are available will likely be in clerical or service fields rather than in the skilled trades.

Table 2.9, "Employment in New York City by Major Industry Category," substantiates the recent decline of the city's economy. All industry categories other than services, government, finance and transportation declined during 1960-1970, and all sectors, including government, have declined substantially since 1970.

The loss of jobs has been most serious in the areas of manufacturing and construction, which provide little more than half the jobs provided in 1960. Employment in services and finance, real estate and insurance vacilated, but remained fairly stable. Losses in transportation and wholesale/retail trade, while not as serious as those in manufacturing, have been steady and substantial. Government employment

Table 2.9

Employment in New York City by Major Industry Category

Industry	1960 (000)	1969 (000)	1970 (000)	1971 (000)	1972 (000)	1973 (000)	1974 (000)	1975 (000)	1976 (000)
Services	683	779.8	784.2	764.6	751.5	797.3	785.0	770.7	763.2
Manufacturing	947	826	766.2	705.0	678.1	653.5	602.1	527.8	523.0
Wholesale, Retail Trade	745	749	735.5	708.9	724.2	716.2	665.1	635.3	625.5
Finance, Ins, Real Estate	391	466	459.6	452.7	444.2	434.6	425.8	422.1	418.1
Transportation, Pub. Utils.	318	324	323.3	298.6	299.1	285.1	282.7	268.4	262.0
Construction	125	105	110.1	112.8	106.2	105.4	99.9	77.9	72.5
Government	408	547	562.8	569.2	564.5	574.4	580.7	572.1	524.2
Federal	116	106	107.5	103.3	99.0	95.7	94.4	91.4	86.6
State	24	38	40.9	43.0	41.5	43.2	45.5	47.9	47.6
Local	268	403	414.5	422.9	424.0	435.5	440.8	432.8	390.0
Total	3538	3798	3743.6	3613.4	3562.1	3571.4	3444.6	3275.9	3190.1

Source: U.S. Dept. of Labor, Bureau of Labor Statistics - Regional Office; Monthly and Annual Employment Trends, 1960-1977.

grew until the most recent economic crunch when, primarily as a result of large cutbacks in New York City's municipal employment, government employment declined by over 56,000 in the city from 1974 to 1976.

What all these figures indicate, in addition to a declining job market, is a shift from an economy based on manufacturing to one based on employment in sales and services. Table 2.10, "1976 Projections of Non-College Occupations by Occupational Category," bears this out. Clerical jobs are expected to account for over half the projected non-college job openings in 1976. Service workers, managers/proprietors, and sales workers together make up nearly another 40%. Fewer than 10% of the available non-college openings are expected to be for craftsmen, machine operators or laborers.

Table 2.11, "Projection of Non-College Occupations by Major Occupational Category and Subcategory," clarifies this trend still further. The major job categories for clericals are clerks and secretaries, the major employment areas in the service fields are cleaning and health services. It is clear that those fields with the greatest employment capacity are also the ones most open in terms of the ratio of job openings to total employment in the field. Secretarial work and health service work in particular are projected to have a relatively high percentage of openings. On the other hand, there is scarcely any turnover among the decreasing numbers of craftsmen and machine operators, and thus there are virtually no projected job openings.

Table 2.10

1976 Projections of Non-College Occupations by Major Occupational Category Excluding Agriculture

	Job Openings	% of Total Non-College Job Openings	Openings Due to Growth	% of Total Decline Represented	Openings due to Separation	%	Employment 1976	Ratio of Field Total Non-College Employment
1. Clerical workers	50,738	54.64	-3,450	9.68	54,188	42.17	962,022	32.18
2. Service Workers	17,870	19.24	-6,014	16.88	23,884	18.59	501,143	16.77
3. Managers, officials, proprietors	9,679	10.42	-1,067	2.99	10,746	8.36	325,271	10.88
4. Sales workers	8,088	8.71	-3,547	9.95	11,635	9.05	277,658	9.29
5. Operatives	3,273	3.52	-13,572	38.09	16,845	13.11	454,589	15.21
6. Craftsmen, Foremen, etc.	3,018	3.25	-6,054	16.99	9,072	7.06	363,943	12.18
7. Laborers, excluding farm	197	0.21	-1,932	5.42	2,129	1.66	104,508	3.50
TOTAL	92,863	100.00	-35,636	100.00	128,499	100.00	2,989,134	100.00

Source: Manpower Projections New York City 1970-1980 (New York State Department of Labor, July 1975)

Table 2.11

1976 Projections of Non-College Occupations by Major Occupational Category and Subcategory (Except Agriculture)

	1976 Total Employment	Job Openings Number	Job Openings %	Growth	Separation
I. Clerical Workers	962,022	50,738	5.3	-3,450	54,188
1) General Clerical Workers	590,604	25,168	4.3	-3,942	29,110
2) Stenographers, Typists & Secretaries	325,531	24,002	7.4	1,128	22,874
3) Office Machine Operators	45,887	1,568	3.4	-636	2,204
II. Service Workers	501,143	17,870	3.6	-6,014	23,884
1) Cleaning Service	120,099	5,162	4.3	-278	5,440
2) Health Service	66,085	4,717	7.1	945	3,772
3) Personal Service	69,147	2,667	3.9	-1,379	4,046
4) Protective Service	87,495	2,574	2.9	537	2,037
5) Private Household	46,490	1,454	3.1	-2,226	3,680
6) Food Service	111,827	1,296	1.2	-3,613	4,909
III. Managers, Officials & Proprietors	325,271	9,679	3.0	-1,067	10,746
1) General Managers, Officials & Proprietors	223,315	6,354	7.8	-1,085	7,439
2) Buyers, Sales & Loan Managers	73,266	2,011	2.7	-260	2,271
3) Administrators & Public Inspectors	28,690	1,314	4.6	278	1,036
IV. Sales Workers	277,658	8,088	2.9	-3,547	11,635
V. Operatives	454,589	3,273	0.7	-13,572	16,845
1) Miscellaneous Transportation	252,948	1,640	0.6	-9,803	11,443
2) Transportation Equipment	133,581	1,281	1.0	-1,589	2,870
3) Semiskilled Packing & Inspecting	43,668	461	1.1	-1,355	1,816
4) Semiskilled Textile	7,543	-16	-0.2	-330	314
5) Semiskilled Metal Working	16,849	-93	-0.6	-495	402

Table 2.11 (cont.)

	1976 Total Employment	Job Openings		Growth	Separation
		Number	%		
VI. Craftsmen, Foremen, Etc.	363,943	3,018	0.8	-6.054	9,072
1) Mechanics, Repairers & Installers	82,316	1,239	1.5	-212	1,451
2) Construction Craftsmen	89,490	1,015	1.1	-1,190	2,205
3) Foremen	60,926	865	1.4	-718	-1,587
4) Miscellaneous Craftsmen	62,967	415	0.7	-2,003	2,418
5) Transportation Public Utility Craftsmen	22,823	96	0.4	-155	251
6) Printing Trades Craftsmen	26,530	-296	-1.1	-1,006	710
7) Metal Working Craftsmen	18,891	-316	-1.7	-770	454
VII. Laborers, except Farm	104,508	197	0.2	-1,932	2,129
TOTAL	2,989,134	92,863	3.1	-35,636	128,499

Source: Manpower Projections New York City 1970-1980 (New York State Department of Labor, July 1975)

2.5.2.2 Specific Occupational Trends

Manpower Projections, New York City - 1970-1980, issued by the State Department of Labor, provides the most comprehensive data on projected job openings in the New York City area. They are, however, based on 1970 census data, and thus do not take into account the effect of recent developments in the local economy. Unfortunately, at this time, this is the only information available on the New York City labor market which provides detailed information on occupational growth trends.

(The U.S. Department of Labor, Bureau of Labor Statistics, recognizing the need of vocational planners and counselors for detailed occupational employment trends, has established the Occupational Employment Statistics Program in conjunction with the local state employment security division. The first products of this joint effort program were the 1980 projections. However, most states and metropolitan areas have already developed their second round of 1985 projections. It is anticipated that the local state department of labor will soon issue the new 1985 manpower projections for New York City.)

In reviewing the 1980 manpower projections for New York City, we have focused our attention on those occupations which do not require a college degree. Employment projections for all 241 occupations appear in Appendix C. In addition, we will summarize the highlights of the manpower projections for non-college occupations in the following tables.

Table 2.12 presents the "top" twenty job categories of those jobs which do not require a college degree.

Table 2.12

Average Annual Job Openings 1976-1980,
"Top" Twenty Projected Jobs

Occupation	1976 Employment	Total job openings Number	Total job openings %	Openings due to growth	Openings due to labor force separations
1. Secretaries, other	213,412	16,619	7.8	1,532	15,087
2. Typists	92,255	6,038	6.5	-336	6,374
3. Bookkeepers	113,132	4,903	4.3	-1,545	6,448
4. Sales clerks, retail trade	111,044	4,668	4.2	-1,274	5,942
5. Other managers	174,248	4,582	2.6	-924	5,506
6. Miscellaneous clerical	44,561	3,069	6.9	938	2,131
7. Janitors and sextons	56,456	2,600	4.6	320	2,280
8. File clerks	49,489	2,528	5.1	-551	3,079
9. Nurses aides, orderlies	38,570	2,399	6.2	378	2,021
10. Sewers and stitchers	94,935	2,238	2.4	-3,709	5,947
11. Cleaners and charwomen	55,029	2,187	4.0	-421	2,608
12. Cashiers	36,336	1,819	5.0	-307	2,126
13. Receptionists	21,833	1,411	6.5	-105	1,516
14. Telephone operators	29,217	1,307	4.5	-657	1,964
15. Guards and watchmen	30,593	1,306	4.3	-10	1,316
16. Teachers' aides	15,021	1,288	8.6	700	588
17. Bank tellers	19,999	1,247	6.2	131	1,116
18. Practical nurses	12,802	1,179	9.2	346	833
19. Hairdressers, cosmetologists	18,535	1,080	5.8	-15	1,095
20. Statistical clerks	25,683	1,050	4.1	-235	1,293

Source: Manpower Projections New York City 1970-1980 (New York State Department of Labor, July 1975)

These are expected to provide the greatest number of job openings in the New York City area by 1980. Clerical and secretarial jobs will constitute a major source of openings (half of the top ten of these categories are in the clerical field). These projections are based on the number of job openings which will result due to both economic growth and replacement (the filling of positions from which other employees have retired). All figures are based on the previously cited Manpower Projections, New York City - 1970-1980.

In addition, a second list of occupations (which do not require college degrees), which are expected to undergo moderate growth (600 to 1000 job openings per year) is presented in Table 2.13. The major growth occupations within this classification are in personal, public and business services.

As a corollary to the list of occupations expected to provide the greatest number of jobs, we have also prepared a list (based on the 1980 manpower projections) of the twenty occupations (non-college) expected to experience the greatest decline by 1980 (Table 2.14). As this table indicates, these occupations will be in the unskilled and semi-skilled blue collar areas. This projected decline is based on the assumption that current trends in the local economy will continue (e.g., manufacturing will continue to decline, additional printing firms will leave the city, automation of elevators and at airports will continue to increase, etc.). These trends are also consistent with national trends, which project a decline in blue collar employment and an increase in white collar employment by 1980.

Table 2.13

Average Annual Job Openings 1976-1980, Jobs Projected to Show Moderate Growth

Occupation	1976 Employment	Total job openings		Openings due to growth	Openings due to labor force separations
		Number	%		
1. Maids, servants, private	33,313	984	3.0	-1,614	2,598
2. Managers, superintendents	12,880	878	6.8	248	630
3. Foremen	60,926	865	1.4	-718	1,583
4. Health aides, ex. nursing	9,527	811	8.5	277	534
5. Taxicab drivers, chauffeurs	26,994	806	3.0	-55	861
6. Policemen and detectives	40,157	781	1.9	399	382
7. Legal secretaries	8,487	768	9.0	173	595
8. Mail handlers, ex. P.O.	15,983	743	4.6	12	731
9. Airline stewardesses	6,047	717	11.9	159	558
10. Office managers	15,041	715	4.8	128	587
11. Estimators, investigators	18,873	689	3.7	-89	778
12. Sales reps, wholesale	49,844	671	1.4	-974	1,645
13. Counter clerks, not food	14,264	639	4.5	-58	697
14. Buyers, wholesale, retail	18,658	634	3.4	-170	804
15. Stock and bond salesmen	19,215	621	3.2	31	590
16. Bus drivers	17,120	614	3.6	206	408
17. Messengers and office boys	13,644	604	4.4	-356	960
18. Salesmen, svc & construction	14,918	603	4.0	7	596
19. Billing clerks	8,989	594	6.6	73	521
20. Waiters	39,840	593	1.5	-1,492	2,085

Source: Manpower Projections New York City 1970-1980 (New York State Department of Labor, July 1975)

Table 2.14

Average Annual Job Openings 1976-1980, Jobs Projected to Show Greatest Decrease

Occupation	1976 Employment	Total job openings Number	Total job openings %	Openings due to growth	Openings due to labor force separations
1. Elevator operators	8,691	-380	-4.4	-886	506
2. Machine operators, misc.	24,705	-253	-1.0	-1,008	755
3. Truck drivers	43,270	-230	-0.5	-974	744
4. Meat cutters, butchers, ex. mfg.	10,992	-178	-1.6	-499	321
5. Clothing ironers and pressers	13,422	-169	-1.3	-775	606
6. Compositors and typesetters	10,156	-160	-1.6	-477	317
7. Operatives	25,087	-145	-0.6	-986	841
8. Bakers	7,626	-137	-1.8	-372	235
9. Pressmen and plate printers	10,611	-132	-1.2	-352	220
10. Longshoremen and stevedores	9,921	-127	-1.3	-383	256
11. Construction laborers	17,288	-125	-0.7	-440	315
12. Filers, polishers, sanders	3,998	-122	-3.1	-238	116
13. Barbers	5,192	-115	-2.2	-365	250
14. Sailors and deckhands	3,239	-109	-3.4	-187	78
15. Machinists	7,890	-108	-1.4	-308	200
16. Busboys	3,116	-104	-3.3	-154	50
17. Freight, material handlers	25,829	-95	-0.4	-580	485
18. Baggage porters and bellhops	1,505	-87	-5.8	-136	49
19. Tool and diemakers	3,267	-76	-2.3	-158	82
20. Vehicle washer, equip. cleaner	3,530	-75	-2.1	-149	74

Source: Manpower Projections New York City 1970-1980 (New York State Department of Labor, July 1975)

2.5.2.3 Summary of Findings: The NYC Labor Market

Certain findings emerged with remarkable consistency during the labor market survey conducted for the COER Project by the Educational Planning Institute. The research clearly shows that:

- clerical fields are expected to provide the greatest number of job openings within the New York City economy as a whole;
- these fields have a history of providing employment for youth; and
- while there are substantial numbers of applicants for these positions, they have been difficult to place due to inadequate performance in basic and/or office skills.

Clericals represent the largest non-college job category, providing some 32% of non-college employment. The ratio of job openings in this field is even higher, with clericals representing 54% of total projected job openings for 1976. The need for skilled clerical workers is indicated by both long-term projections and short-term employment service reports. In addition, this is an area which has traditionally proven receptive to youth. Clericals represent 43% of the youth work force in New York City, which is higher than their percentage representation in the total work force. The ratio is even higher among the younger age categories (clericals accounting for 51% of the workers between 14 and 19 years of age in New York City).

Within the clerical field, the greatest demand is for skilled secretaries. In addition, the job prospects for typists and bookkeepers are also favorable. Each of these latter occupations is projected to offer both long-term and short-term demand. While neither is projected as a growth occupation, labor force separations are expected to be sufficient to keep each of these job categories at significantly over 3% of the projected job market.

Typists represent an occupational field which has previously proven receptive to youth (over a third of the typists in New York State are under 24 years of age), while bookkeepers have apparently been much less so (only a sixth in New York State are under 24). Comments from the area manpower review indicate that applicants for these positions, as well as secretarial ones, have been difficult to place due to inadequate skills.

Miscellaneous clericals constitute another job category which may be expected to provide some openings as well. However, Area Manpower Review indicates that applicants for miscellaneous clerical positions require some additional secretarial skills. This source also substantiates the need for those skills in placing applicants in other clerical positions (receptionists and telephone operators, for example).

A second clear conclusion of the Educational Planning Institute study concerned the chronic need for skilled sewing machine operators in New York City. While not a growth field, labor force separations alone create sufficient job openings to rank this job category tenth highest in the city in terms of job openings. The Area Manpower Review makes it clear that different jobs for sewers and stitchers often require highly specialized skills which are not necessarily transferable from one job to another. The skill and experience requirements for this occupation suggest it as a good candidate for COES/CDC training and placement efforts.

However, this job category has, in the past, proven to be extremely unreceptive to youth. To date, youth have accounted for only 6.8% of all such jobs in New York State. (Due to the concentration of garment manufacturers in New York City, this figure is more readily transferable to the local area than is the case for other fields which are more widely dispersed throughout the state.) By virtue of these chronic shortages and the need for skilled personnel, this field is a potential candidate for CDC activities (subject to further research as to why this field is not attracting/hiring youth at entry-level positions). Clearly it will also be important to determine what career ladder opportunities are or might become available.

The COES/CDC might also provide training for occupations which, while not projected as long-term sources of jobs, are suffering from current shortages. Further investigation would, of course, be necessary to determine the numbers and types of jobs actually available, as well as how long these trends might be expected to continue. These occupations fall within the blue collar segment of the economy which, while in an overall state of decline both nationally and locally, does encompass skills which are demand occupations in New York City.

One such category is auto mechanics and maintenance. State employment data indicate auto mechanics and auto body repair as demand occupations, with special needs for workers with specific and extensive skills and experience, workers with additional skills (e.g., driving), and workers with their own tools. No statistics are available at this time on how receptive these fields are to youth. However, common sense suggests that youth would most probably be well received, the most likely potential drawback being the initial investment required for rental of space and/or purchase of tools.

A fourth category of job openings is indicated for skilled repairers of machinery. Radio/TV repair presents an especially favorable outlook. It is projected as a growth occupation and also shows a significant percentage of jobs which currently remain unfilled for longer than 30 days -- 41.94%. Area Manpower Review also indicates demand for repairers of other equipment -- sewing machines, office machines, watches. Again, further investigation would be necessary to determine the extent of demand in these fields.

Finally, there are other blue collar jobs which, despite long-term projections to the contrary, show specific and sustained need for skilled workers. Area Manpower Review reports "chronic needs" for skilled machinists and tool and die makers. Especially with the implementation of career ladders in these areas, entry-level positions could become increasingly available and would warrant training and placement efforts.

* * * * *

The research conducted by the Educational Planning Institute has led to the recommendation of four possible job clusters:

- business and office education, where there is an overwhelming and demonstrated need for skilled personnel to fill large numbers of jobs in areas which have been traditionally receptive to youth. This cluster would involve all appropriate areas of study (typing, shorthand, office machines, switchboard operation, other clerical skills).

- fabric service, a field with chronic shortages of skilled personnnel, but which to date has not employed substantial percentages of youth. Such a program would cover dressmaking, pattern making, sewing machine operation, use of various types of machines involving the transfer of skills to such areas as upholstering, draperies, etc.
- auto repair, a field which shows recent need and which warrants further investigation to determine the extent and source of such need. Areas covered would include engine parts, diesel and truck repairs, use of new equipment (e.g., anti-pollution and the latest diagnostic equipment).
- machine maintenance/repair, a field which also indicates short-term need, particularly for radio/TV repairers. Allied areas covered would include air conditioning, washing machines, color TV, locksmithing, etc.

All these clusters would be geared toward training sufficient for immediate entry-level positions. However, that is only the first step. Provisions should also be made for a career ladder program, whereby specific upgrading/training programs are introduced both on the job and through the CDC. In this way, employees who are presently employed in entry-level positions would be trained to fill the chronic need for skilled workers while making room on the entry level for those trained through the COES.

2.5.3 Report on Process

Analysis of the New York City job market began with the assembly of all available office statistical material. Manpower projections, based on federal census data and assembled according to federally recommended procedures, were available for both New York City and New York State from the State Department of Labor. (Their availability for other localities would probably depend upon the size of the area and the research priorities of the State Department of Labor in any given state.) The State Department of Labor was most helpful, both in supplying raw data not included in the official projections, and in explaining and clarifying their reports.

Since there is considerable time lag between projections based on census figures (e.g., projections based on 1970 figures in New York City became available in late 1975), it is important to have supplementary figures on the current job market. Lists of current job shortages and surpluses were obtained from the State Employment Office, and Jobflo provided computerized analysis of these data, to help locate demand occupations. In addition, other research sources deal with or prepare similar data (e.g., vocational education projects within the Board of Education, private youth training programs, union and corporate manpower planners, etc.).

In order to form a picture of the New York City job market, the Educational Planning Institute obtained statistics directly from the New York State Department of Labor, some of it raw data available only on computer tape. Specifically, the Institute used:

- Employment and Earnings, States and Areas (U.S. Department of Labor) and combined it with updated figures from the State Department of Labor to determine trends in New York City employment by major industry category.
- State Department of Labor statistics for employment in various occupations by major industrial category, to investigate how each of ten top projected non-college occupations was divided among major industries, and what percent of employment in such an industrial category was represented by each occupation.
- the same 1970 census data from the State Department of Labor to compute the percentage of each occupational category which falls within each major industry division (1970 residential employment in major industrial category expressed as a percent of total occupational employment).

A substantial amount of the initial research was based on Manpower Projections, New York City - 1970-1980 (State Department of Labor, issued August 1975). In this regard the Institute:

- selected out and compared major non-professional job categories and sub-categories for Tables 2.10 and 2.11;

- used these data for a graph which would give a visual representation of the relations between growth and replacement in these major job categories (Figure 2.8).
- from the occupations listed in Manpower Projections, selected out the forty non-college occupations expected to provide the largest number of job openings, based on both growth and replacement (Tables 2.12 and 2.13).
- from the same source, selected those twenty non-college jobs which were expected to lose the largest number of employees (Table 2.14).
- selected those non-college occupations which were expected to gain jobs on the basis of growth alone. (These tended to be numerically insignificant and/or overlapped occupations which had resulted from one of the other processes. Thus they are not included here. Obviously, however, this process would be of greater significance in an area or period in which the economy is more oriented toward growth than is New York City at the present time.)

To investigate which job categories have been receptive to youth in the past, figures for New York State were gathered regarding youth employment in specific occupations. Local figures were available by occupational category only. Therefore the Institute:

- took the original twenty occupations for which the greatest demand was projected (in Manpower Projections) and set these against state employment figures for the 14-19 and 20-24 age groups. While state figures and ratios are obviously not identical to those for the city, they nevertheless provided a rough idea of which job categories had previously provided youth employment. It was found, for example, that cashiers and typists were categories receptive to youth employment, while sewers and stitchers were not.

- charted these job categories based on state figures as to employment of the largest number of youth, both in the 14-19 and 20-24 age ranges. From this, it became clear that in certain jobs (e.g., stock handlers and newspaper deliverers), youth between 14 and 19 make up over half of the total.
- using data received from the U.S. Manpower Administration, constructed charts which showed youth employment in New York City by major job category and by major job category and sex.

The Institute used Jobflo and Area Manpower Review, both publications of the State Department of Labor, which indicate what occupations are presently in demand and which are oversupplied. Both are based to some extent on the figures available from the State Employment Service, and each supplements the other.

Jobflo provides data on the number of openings and the number of openings unfilled after thirty days. It uses occupational categories very finely broken down by specific job title. However, it gives no information as to surpluses and provides little indication as to whether the demand is short-term or ongoing. Furthermore its very specific job categories have proven difficult to integrate with other sources.

Area Manpower Review, on the other hand, indicates both shortages and surpluses, and provides an interpretive narrative which indicates to some extent how the observed shortages and surpluses fit in with longer-term trends in the city's economy. It discusses the reasons for both shortages and surpluses. Such discussion has proven very useful, particularly vis-a-vis the CDC. However, the absence of any numerical data on the extent of the shortages makes the urgency of demand difficult to assess.

With the foregoing taken into consideration, the Institute:

- collected and examined these data in order to determine how they related to our previous conclusions.
- prepared a revised list of possible demand occupations from among the top twenty projected occupations, as well as those additional job categories where substantial demand was indicated by one of the above two sources.
- devised a chart in which each of these possible demand occupations was assessed in light of information from the other two sources, i.e., some jobs which had been projected to increase were in fact showing a surplus of applicants, while others which had been projected for severe decline were exhibiting a short-term lack of skilled applicants.
- applied to this revised list of possible demand occupations the first three of the

selected criteria for "demand occupations" found in Guidelines for the Use and Analysis of Data Resulting from the Interim Manpower Projection Program.

- assembled material into appropriate charts, provided written narratives explaining each chart, and provided an introductory analysis of the data. The information also led to the formation of suggested tentative job skills clusters for which training in a CDC might be provided.

2.6 THE NEED AS DETERMINED THROUGH INTEREST SURVEYS

Project staff conducted five separate interest surveys during the spring of 1976. Each of the surveys sampled the interests of different populations with regard to career and occupational training. (Additional information was gathered which would be of use in planning components such as transportation patterns, but they will not be analyzed here.) One of the functions of the surveys was to identify those occupational areas for which there is a popular demand for training.

Those surveyed included 2,181 Bronx academic/comprehensive high school students; 747 junior high school students; 1,200 long-term absentees from Bronx academic/comprehensive high schools; 407 parents of students in Bronx academic/comprehensive high schools; and 1,274 clients of the Bronx Career Counseling and Resource Center. (See Attachments.)

By comparing the results of such surveys with the realities of the labor market, decisions can be made relative to the planning of occupational training programs. For example, in those areas where interest is high and job prospects are good, plans can be made to add additional courses or seats to meet the demand of both the target populations as well as of the labor market. Conversely, programs can be curtailed for areas where interest is low and job prospects poor.

Furthermore, such surveys offer insight into popular awareness of conditions in the labor market. By their choices of occupations for which they desire training, the respondents also indicate the extent to which they know what jobs are and will be available. Such surveys thus indicate whether there is a need for more career information and, if so, on what levels (i.e., junior high school, high school, adult).

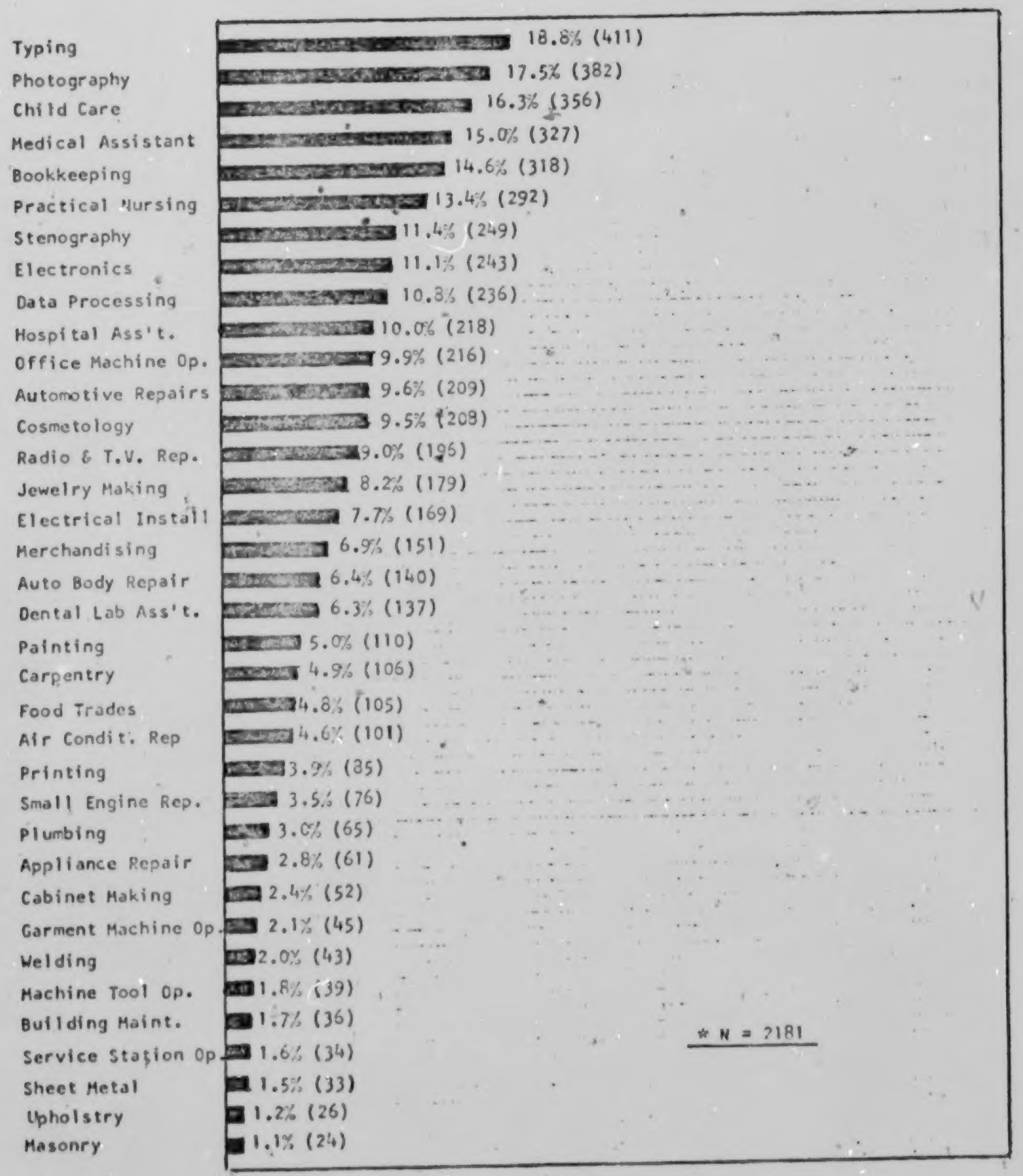
The results for each of the five surveys are presented in Figures 2.9 through 2.13. These figures represent tabulations for only the last question in each of the surveys. That question was basically the same on all five surveys, with some variation for the parental and Bronx Career Counseling surveys. The question was: "We want you to list the occupational program(s) in which you would now like some training." (For the parental survey, the question asked which training programs they considered "of value" for their children. For the Bronx Career Counseling Survey, the question asked which occupations they were interested in at intake.)

The reader will note that the results are presented as percentages of the total number of respondents for each course of instruction. There is no overall total since respondents could respond under as many of the courses as they wished. (With the exception of the Bronx Career Counseling Survey, which was completed from records of clients. In this instance, only their first choice was placed on the questionnaire.) But an overall view does give an indication of overall interest viz. occupational training. The ratio of responses to respondents (average number of responses) was high for all four questionnaires where multiple responses were allowed. This ratio can be used to compare relative importance of training among the groups sampled. The ratios were:

Figure 2.9

High School Interest Questionnaire

Percent of Total Respondants Who "Want to Take"*



* N = 2181

Figure 2.10

Junior High School Interest Survey

Percent of Total Respondants* Who " Want to Take"

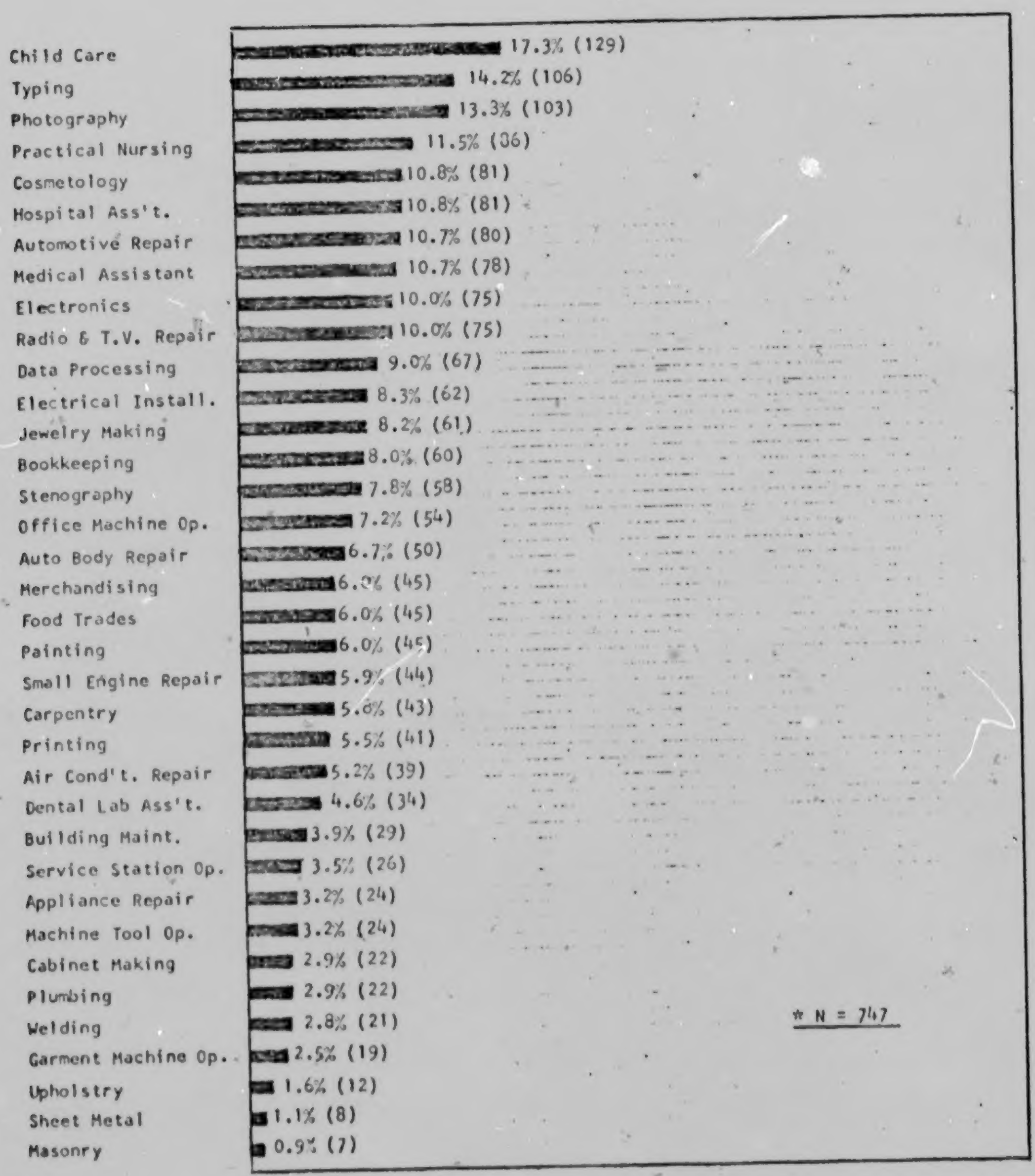
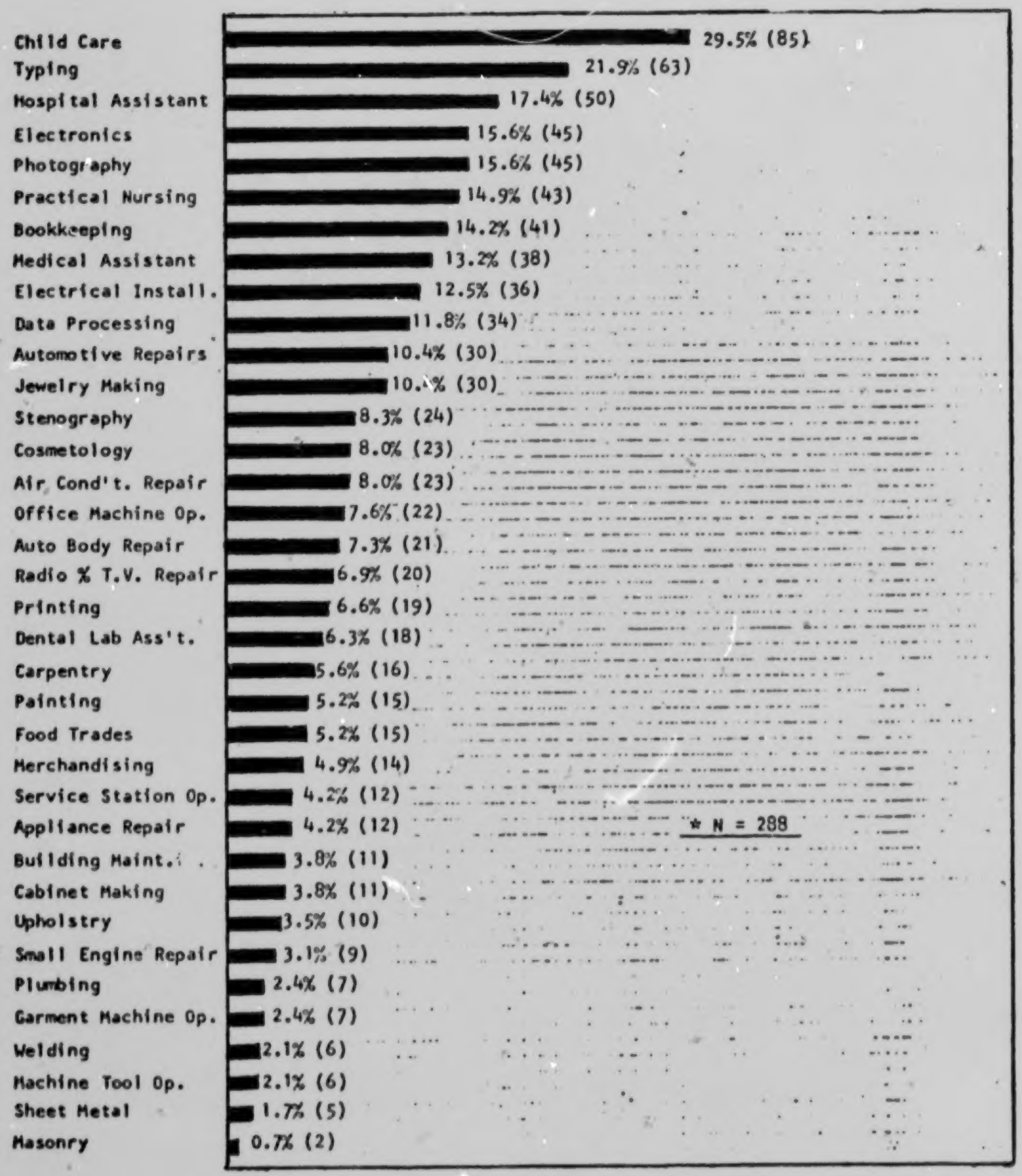


Figure 2.11

Long-Term Absentee Interest Survey



Percent of Total Respondants* Who "Want to Take"

Figure 2.12

Parental Interest Survey

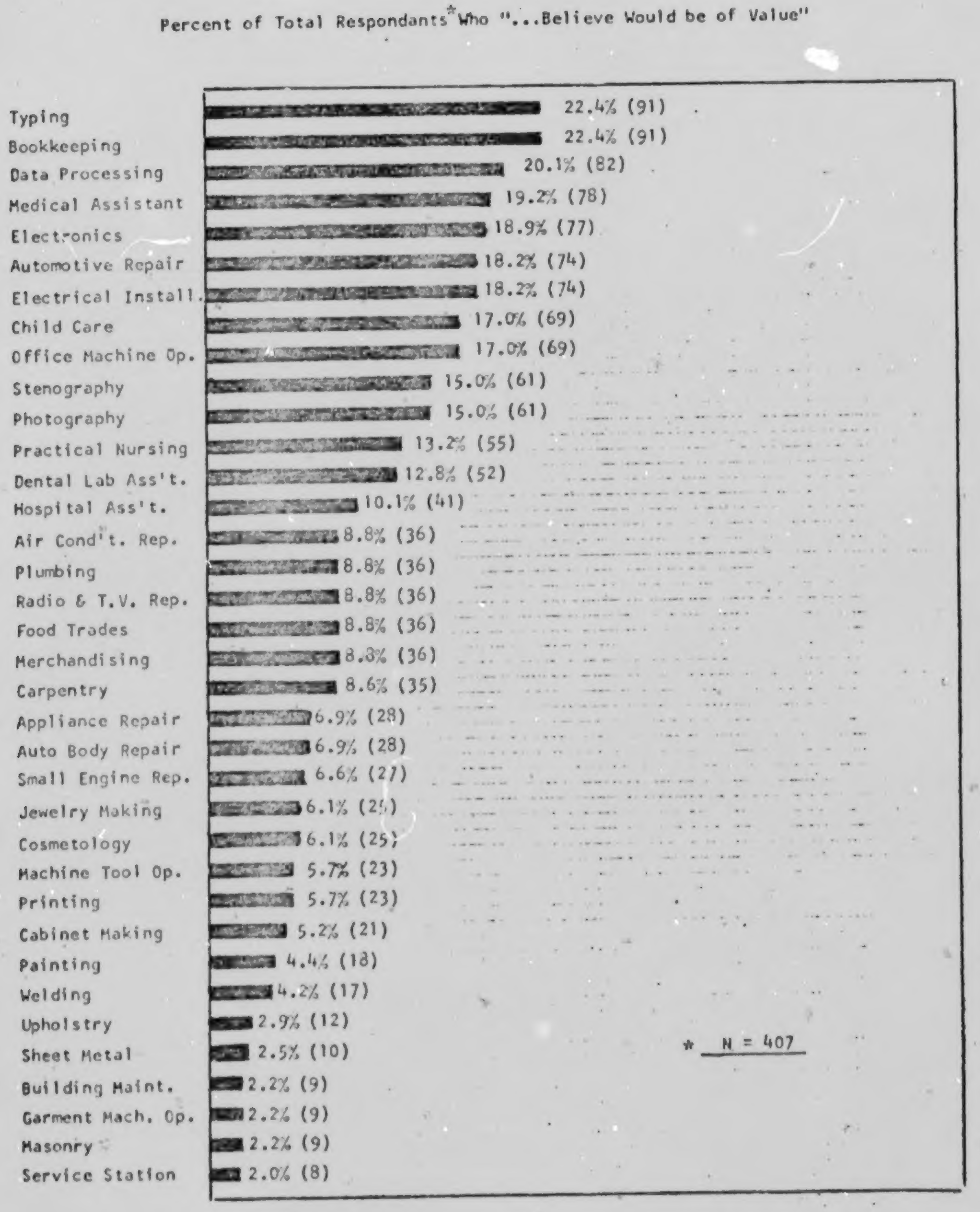
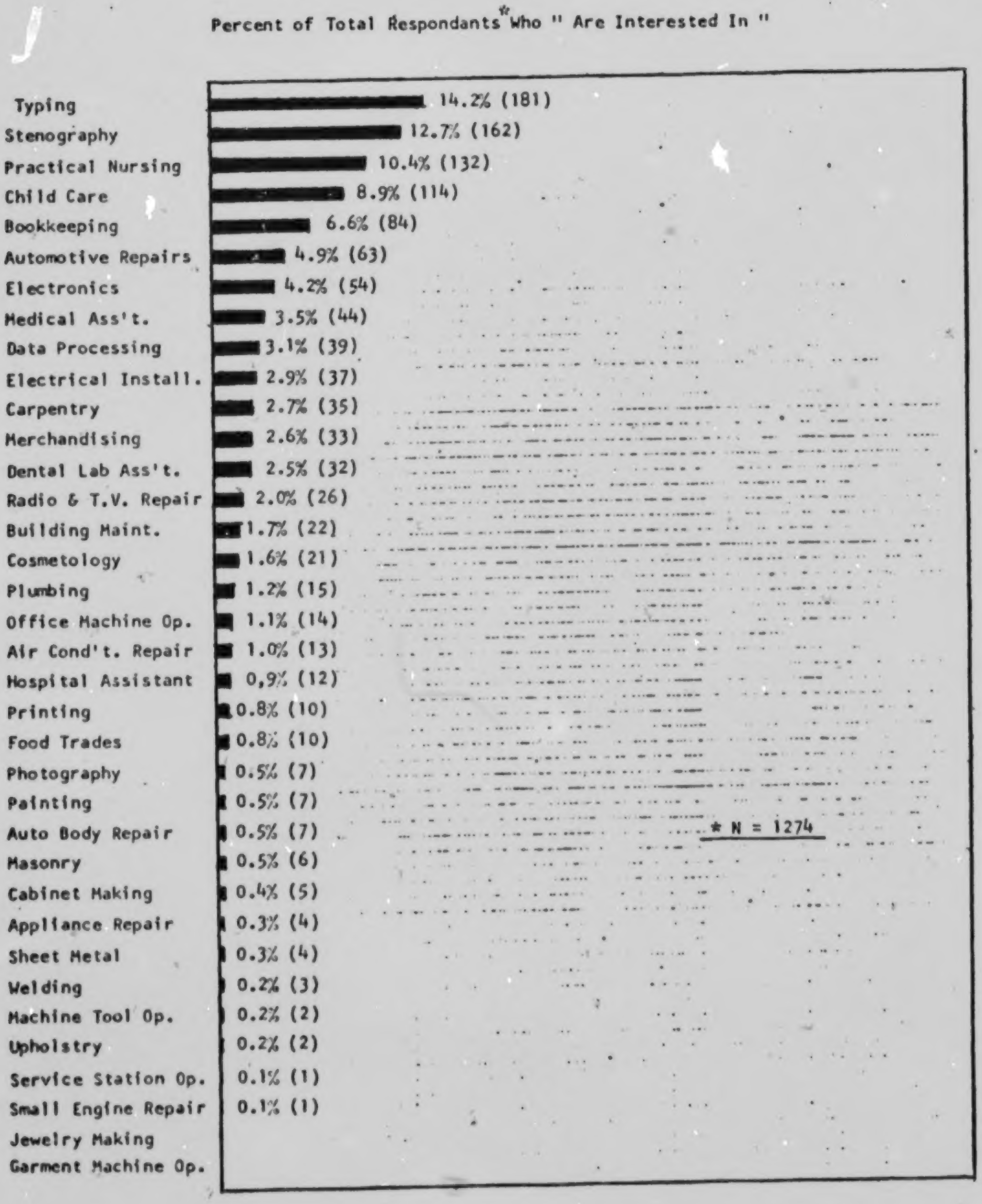


Figure 2.13

Bronx Career Counseling Interest Survey



Percent of Total Respondants* Who " Are Interested In "

* N = 1274

Parental Interest Survey	3.6:1
Long-Term Absentee Survey	3.0:1
High School Interest Survey	2.6:1
Junior High School Survey	2.5:1

Of the four groups of respondents, parents considered training most important, although it would seem logical to assume that the Bronx Career Counseling Survey would have exhibited the highest ratio had the survey been administered in the same manner as the others. The long-term absentees ranked second to the parents, with the high school and junior high school students finding training of less importance than either the parents or absentees.

Figures 2.9-2.13 present the results for each of the surveys by rank order of the number of responses as a percentage of total respondents. In three of the five surveys, Typing ranked #1 (and in the other two, it was #2). Four occupations (Typing, Child Care, Medical Assistant and Electronics) ranked in the top ten on all five surveys. Three occupations (Bookkeeping, Practical Nursing and Data Processing) were in the top ten on four of the surveys. Five occupations (Photography, Stenography, Hospital Assistant, Automotive Repair and Electrical Installation) were in the top ten on three surveys. Radio/TV Repair, Cosmetology and Office Machines Operation each appeared in the top ten of only one survey.

In most cases, those occupations appearing in the top ten on three or four of the surveys are ranked within the top fifteen. This points out a general consensus among the target populations with regard to what they want in terms of occupational training. This does not imply that only the top ten occupations should be considered. For most of the surveys, occupations ranking 20th or lower are still desirable to 5% of the respondents.

* * * * *

The second part of the analysis concerns itself with awareness of realities in the labor market. Here the results are mixed. For example, Typing was the highest ranked course overall. This closely correlates with the labor market, where secretaries and typists are in greatest demand. On the other hand, the high school, junior high school and long-term absentee surveys rank Photography high on the list. (Indeed, it is #2 on the high school, #3 on the junior high school, and #5 on the long-term absentee surveys.) But it must be recalled that Photography is a "glamour" occupation which is highly attractive to young people, which accounts for this result. The parental survey ranked it 11th and the Bronx Counseling survey 23rd. These latter two surveys represent more realistic appraisals of labor market conditions.

Table 2.15 shows the overall picture for all five surveys. The #1 ranked occupation is Typing, followed by Child Care, Practical Nursing, Medical Assistant, Bookkeeper, Electronics, Data Processing, Automotive Repairs, Photography and Stenography, in that order. Again with the exception of Photography and Practical Nursing, responses closely relate to actual conditions in the labor market. The 31st through 36th occupations also reflect conditions in the labor market, for example a lack of jobs (such as for masons), poor working conditions and low wages (such as for garment machine operators), or the need for experience or apprenticeship training (as for sheet metal workers).

Table 2.15

COER Project Interest Surveys, Occupational Ranks by Average of Ranks

"Top Ten"	Second Ten	Third Ten	Last Six
Typing	Hospital Assistant	Jewelry Making	Welding
Child Care	Electrical Installation	Food Trades	Upholstery
Practical Nursing	Office Machine Operator	Printing	Machine Tool Operator
Medical Assistant	Radio/TV Repairs	Painting	Garment Machine Operator
Bookkeeping	Cosmetology	Plumbing	Sheet Metal Worker
Electronics	Merchandising	Appliance Repairs	Masonry
Data Processing	Dental Lab Assistant	Small Engine Repairs	
Auto Repairs	Carpentry	Building Maintenance	
Photography	Auto Body Repairs	Cabinet Making	
Stenography	Air Conditioning Repairs	Service Station Operator	

FOOTNOTES/CHAPTER TWO

[1] I.e., new entrants into the labor force plus those unemployed persons in search of work.

[2] The New York State Department of Labor defines underemployed or underutilized as, "those persons who are so classified not because they are unemployed, but because they are:

- employed part-time for economic reasons
- employed full-time but with a family income at or below the povery level;
- not in the labor force "but should be."

[3] George Quarles, Chief Administrator of the Center for Career and Occupational Education, New York City Board of Education, in an interview for Tomorrow, the newsletter for career education in New York State.

[4] Discrepancies in data, e.g., age groups (16-19, 15-19) and grade levels (9-12, 10-12), etc., are due to the reporting methods used by the data producing agencies. Nevertheless, these represent the best available data, gathered from many different agencies or bureaus within agencies, each of which has its own data reporting system (which is frequently at variance with the methods of other data producers). Attempts to justify the data proved impossible in some instances, and in others would have resulted in estimates of no more value than the original data.

[5] All data are based on the 1975/76 school year, except where otherwise indicated.

[6] It is assumed that those students who do go on to complete their post-secondary training will acquire the necessary skills for employment. But as Mr. Quarles has stated, even those planning to go to college should have skills training. The question is not what should be, but rather one of priorities. Who "needs" the occupational training more? Everyone "could use" it and "should have" it. But not all can have it. Thus priorities must be established.

[7] "In the labor force" refers to those persons who are willing and able to work, whether actually employed or not.

[8] For the balance of this report, all references to "youth" will assume an age range of 16-19, unless otherwise indicated.

[9] This figure includes 9th graders enrolled in junior high schools.

[10] Ninth grade students are excluded due to reporting methods.

[11] Bureau of Labor Statistics, U.S. Department of Labor, Geographic Profile of Employment and Unemployment, 1975.

[12] Annual Planning Report, Fiscal Year 1977, New York City, New York State Department of Labor, May 1976.

[13] Persons who are or should be in the labor force, whose net incomes are above the poverty level ($5500 for non-farm families of four) but less than 125% of the limit.

[14] The New York State Department of Labor defines disadvantaged as: an individual who is poor (or a member of a poor family), who does not have suitable employment and is at least one of the following: a school dropout; a member of a minority group; under 22 years of age; 45 years of age or older; or physically, mentally or socially handicapped.

[15] The New York State Department of Labor's definition is "members of families who receive cash welfare payments or whose net income by source (farm or non-farm), in relation to family size, does not exceed the poverty level." For a non-farm family, the income level is $4680.

[16] These include age, disability, race, education, etc.

[17] Annual Planning Report FY'77, p. 17.

[18] This is equal to the population of the Bronx as a percentage of the population of New York City.

[19] This is an arbitrary figure, since no data are available on the occupational training needs of the unemployed.

[20] This presentation of national trends is based on Occupational Trends to 1980, U.S. Department of Labor (September 1975).

CHAPTER THREE

MASTER PLAN FOR A COMPREHENSIVE OCCUPATIONAL EDUCATION SYSTEM

3.1 INTRODUCTION

According to the New York City Regional Annual Plan (1976-77) and Long Range Plans (1977-80) for Comprehensive Occupational Education, the mission of occupational education in New York City is:

> to provide opportunity for every student and adult in the region to discover and fulfill his/her career aspirations, within a comprehensive and flexible system of educational resources responsive to the labor force requirements of the city.

This definition is consistent with the New York State law which states that:

> The Board of Education of each school district shall provide secondary school pupils and adults access to programs of occupational education, commensurate with the interests and capabilities of those desiring and having a need for preparatory training, retraining or upgrading for employment, and develop realistic programs in accord with manpower needs in existing and emerging occupations for present and projected employment opportunities.

Furthermore, one of the major goals of the New York City Board of Education, identified by the Chancellor when he appointed a task force on occupational education, was "to develop a wide range of options for students, parents and staff ... to meet individual student needs and potential by extending the educational options available to them."

The objectives set forth in the citations above can best be achieved through the implementation of two major components for the delivery of occupational education:

a. A Comprehensive Occupational Education System which would provide coordination and support services by:

   - providing a centralized information system to all component parts of the school system;
   - assisting in the development of a coordinated system-wide occupational education delivery unit;
   - providing assistance in the development of curriculum;
   - providing assistance in staff development efforts;
   - coordinating guidance, counseling and other support services;
   - acting as a catalyst for improved coordination with business, industry, labor and the community; and
   - testing and developing new courses which can later be implemented in other component parts of the system.

b. A Career Development Center, as described in Chapter Four, to:

   - provide training to complement existing courses available to secondary students, the handicapped, out-of-school youth, and adults for whom it would not be economically feasible or practical to offer training at existing facilities;
   - test and develop new courses, particularly for new and emerging occupations, which can later be implemented in other component parts of the system; and
   - serve as the headquarters for the coordination efforts of the Comprehensive System.

These two components will undergo in-depth discussion throughout the remainder of this report. To avoid confusion, the reader is advised to bear in mind that the Comprehensive Occupational Education System (COES) refers to the proposed overall delivery system for occupational education, while the Career Development Center (CDC) refers to a physical facility, which would function as an integral part of the COES.

3.2 ORGANIZATIONAL DESIGN OF A COES

Research conducted by the COER Project (see Chapter Two relating to the universe of need), has demonstrated that there is a need in the Bronx to:

- expand and upgrade occupational/vocational programs within the academic/comprehensive and vocational high schools;
- expand existing alternative occupational preparation programs and provide for the development of new approaches to delivering occupational education;
- coordinate existing occupational education programs in the Bronx;
- design improved staff training for occupational teachers and leaders;
- improve career and occupational guidance programs;
- conduct research to assess labor market conditions and plan for new courses while phasing out outdated programs; and
- develop and test new curricular material for specific course offerings.

In an effort to fulfill these needs, three major changes to the present system have been singled out as initial steps:

a. centralization of responsibility for occupational education;

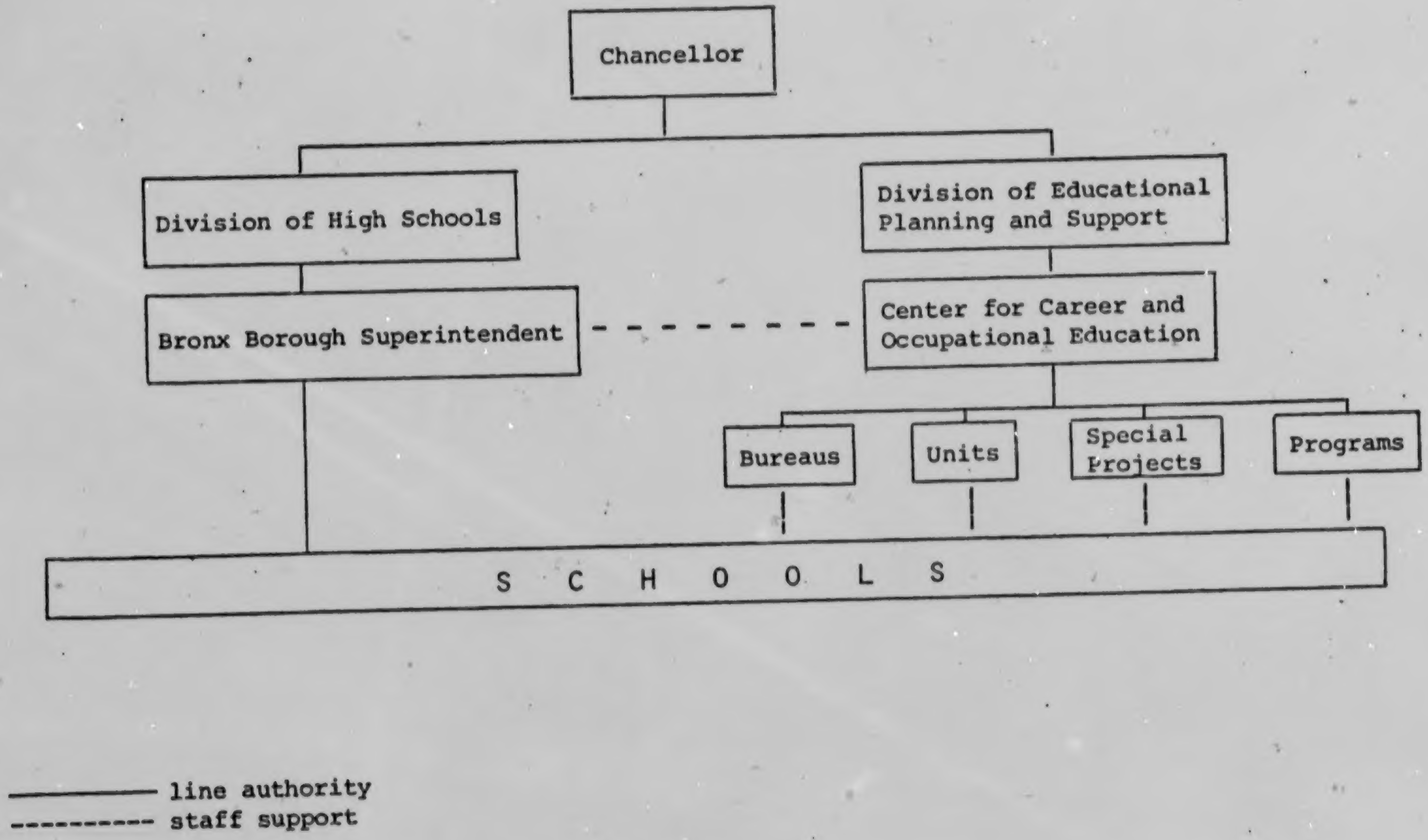
b. development of a comprehensive occupational education system; and

c. development of a career development center.

A comprehensive system is essential if the Board of Education is to meet the diverse needs of the city's students. But under the present system, there is no central line organization for occupational education (see Figure 3.1), resulting in uncoordinated duplication of services and efforts. Presently, the extent to which

Figure 3.1

Present Organization for Delivery of Occupational Education and Support Services


Chancellor
Division of High Schools
Division of Educational Planning and Support
Bronx Borough Superintendent
Center for Career and Occupational Education
Bureaus
Units
Special Projects
Programs
SCHOOLS
line authority
staff support

a school has a successful occupational program is dependent upon the support of the principal and his/her staff.

The comprehensive system must have coherent guidelines and operating procedures for all components of occupational education, as well as coordination among those components. This can only be achieved with a central administration responsible for all coordination, which would ensure:

- the formulation of guidelines and operating principles for all components of occupational education; and
- the coordination of all component parts of the occupational education delivery system.

Thus we recommend the assignment of responsibility for career and occupational education to a director within each of the Borough Superintendent's offices. During the developmental stage, this individual would report to the Center for Career and Occupational Education, (see Figure 3.2a). Thereafter, each Director would report to his Borough Superintendent's office, (see Figure 3.2b).

The following section details the specific duties of this Director, as well as those of his primary assistants within the proposed organizational scheme.

The Project Director for a COES/CDC would be responsible for:

- coordination of all component parts of the occupational delivery system;
- assistance in the formulation and implementation of guidelines and operating principles for all components of occupational education;
- coordination and integration of the efforts of all central office (BEVG, Special Education, COOP) and CCOE (projects, units, offices) programs in delivery support services to the system;

Figure 3.2 a

Proposed Organization for a Comprehensive Occupational Education System

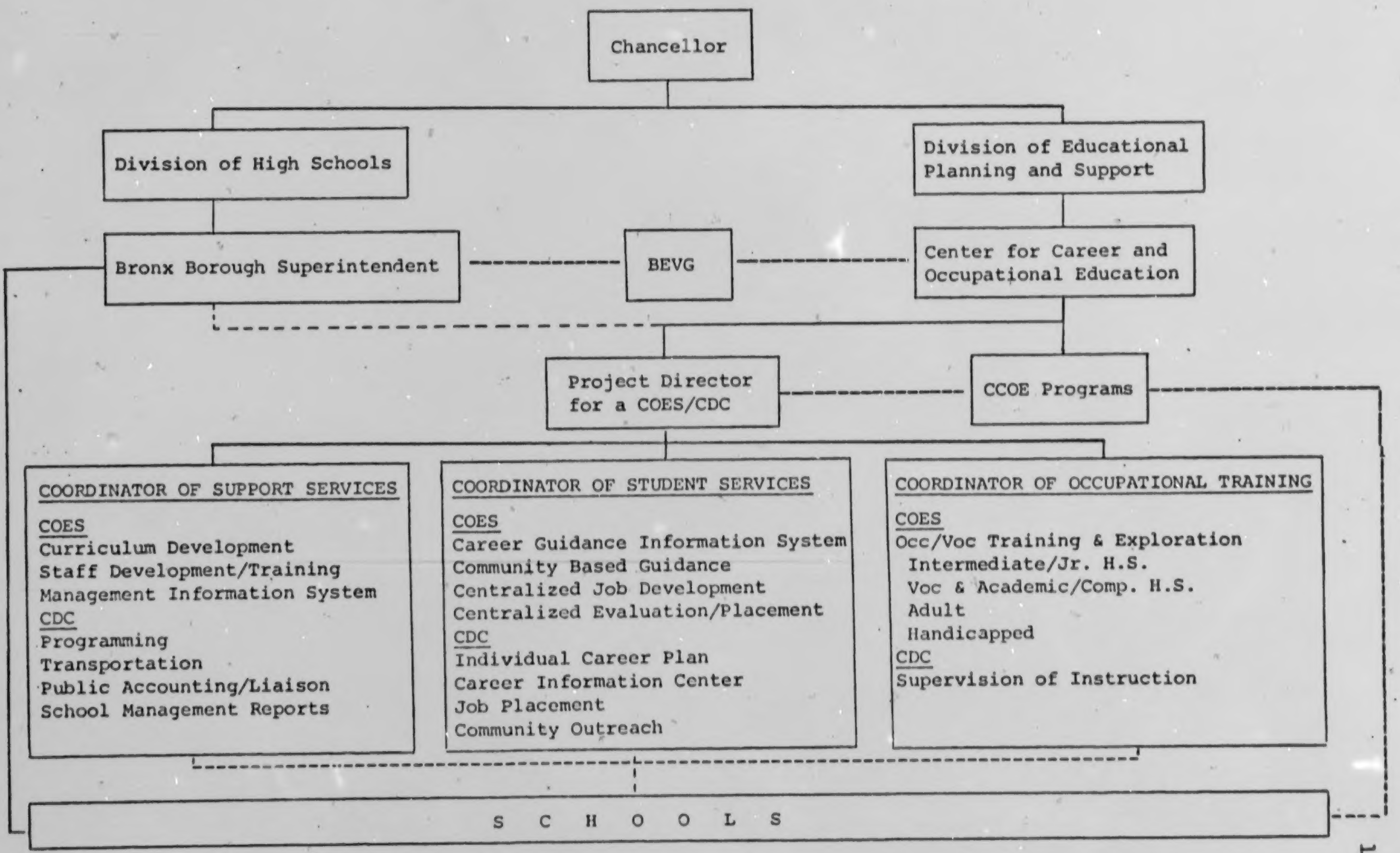
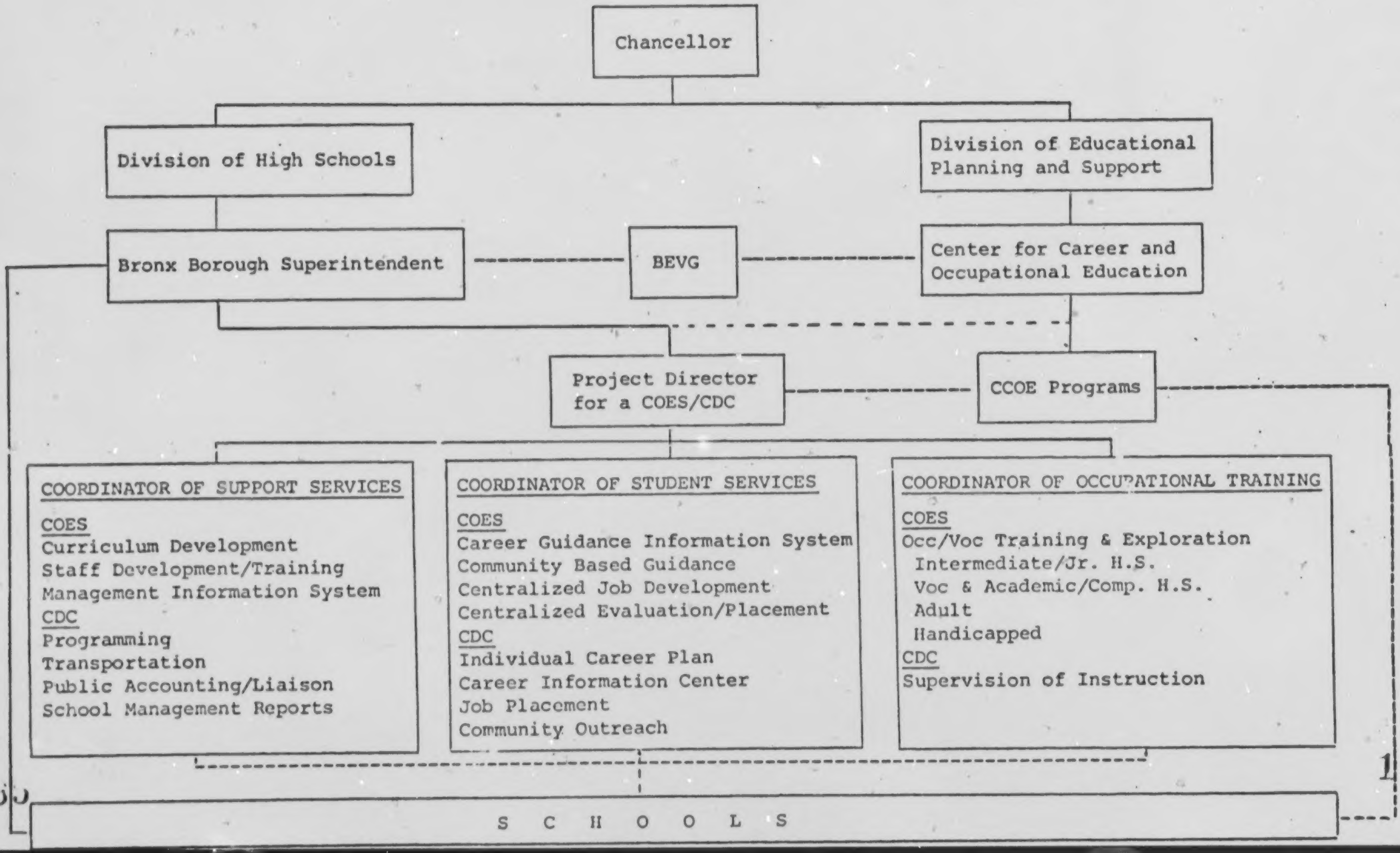

Chancellor
Division of High Schools
Division of Educational Planning and Support
Bronx Borough Superintendent
BEVG
Center for Career and Occupational Education
Project Director for a COES/CDC
CCOE Programs
COORDINATOR OF SUPPORT SERVICES
COES
Curriculum Development
Staff Development/Training
Management Information System
CDC
Programming
Transportation
Public Accounting/Liaison
School Management Reports
COORDINATOR OF STUDENT SERVICES
COES
Career Guidance Information System
Community Based Guidance
Centralized Job Development
Centralized Evaluation/Placement
CDC
Individual Career Plan
Career Information Center
Job Placement
Community Outreach
COORDINATOR OF OCCUPATIONAL TRAINING
COES
Occ/Voc Training & Exploration
Intermediate/Jr. H.S.
Voc & Academic/Comp. H.S.
Adult
Handicapped
CDC
Supervision of Instruction
SCHOOLS

Figure 3.2b

Proposed Organization for a Comprehensive Occupational Education System


Chancellor
Division of High Schools
Division of Educational Planning and Support
Bronx Borough Superintendent
BEVG
Center for Career and Occupational Education
Project Director for a COES/CDC
CCOE Programs
COORDINATOR OF SUPPORT SERVICES
COES
Curriculum Development
Staff Development/Training
Management Information System
CDC
Programming
Transportation
Public Accounting/Liaison
School Management Reports
COORDINATOR OF STUDENT SERVICES
COES
Career Guidance Information System
Community Based Guidance
Centralized Job Development
Centralized Evaluation/Placement
CDC
Individual Career Plan
Career Information Center
Job Placement
Community Outreach
COORDINATOR OF OCCUPATIONAL TRAINING
COES
Occ/Voc Training & Exploration
Intermediate/Jr. H.S.
Voc & Academic/Comp. H.S.
Adult
Handicapped
CDC
Supervision of Instruction
SCHOOLS

- service as a member of and leadership of a Bronx-wide advisory commission for occupational education; and
- development and implementation, as well as administration, of a career development center, through which all programs and services would be coordinated.

The Coordinator for Supportive Services would see to the:

- coordination of curriculum development;
- coordination of staff training and development;
- development and operation of a management information system. (This individual would also be responsible for the operation of the centralized information system.)
- support of and supervision of the Career Development Center in the area of programming, transportation, pupil accountability, and liaison with home schools, as well as completion of management reports.

The Coordinator of Occupational Training would oversee areas relevant to the:

- coordination of occupational training and exploration in the intermediate and junior high schools;
- coordination with vocational high school programs;
- coordination with occupational programs for handicapped students;
- coordination with occupational programs in the academic/comprehensive high schools;
- coordination with alternative occupational programs;
- coordination with adult occupation programs; and
- provision of support and supervision to the Career Development Center in the area of instruction.

The Coordinator of Student Services would bear the responsibility for:

- a career education and program information system, as well as assistance to the Coordinator of Supportive Services in the development of the Centralized Information System;
- coordination of the community-based guidance system;
- coordination of the centralized Job Development Unit;
- coordination of centralized evaluation and placement services;
- coordination of the Bronx career counseling resource center as it functions within the system; and
- provision of support and supervision of the Career Development Center in the areas of individual career planning, career information, job placement and community outreach.

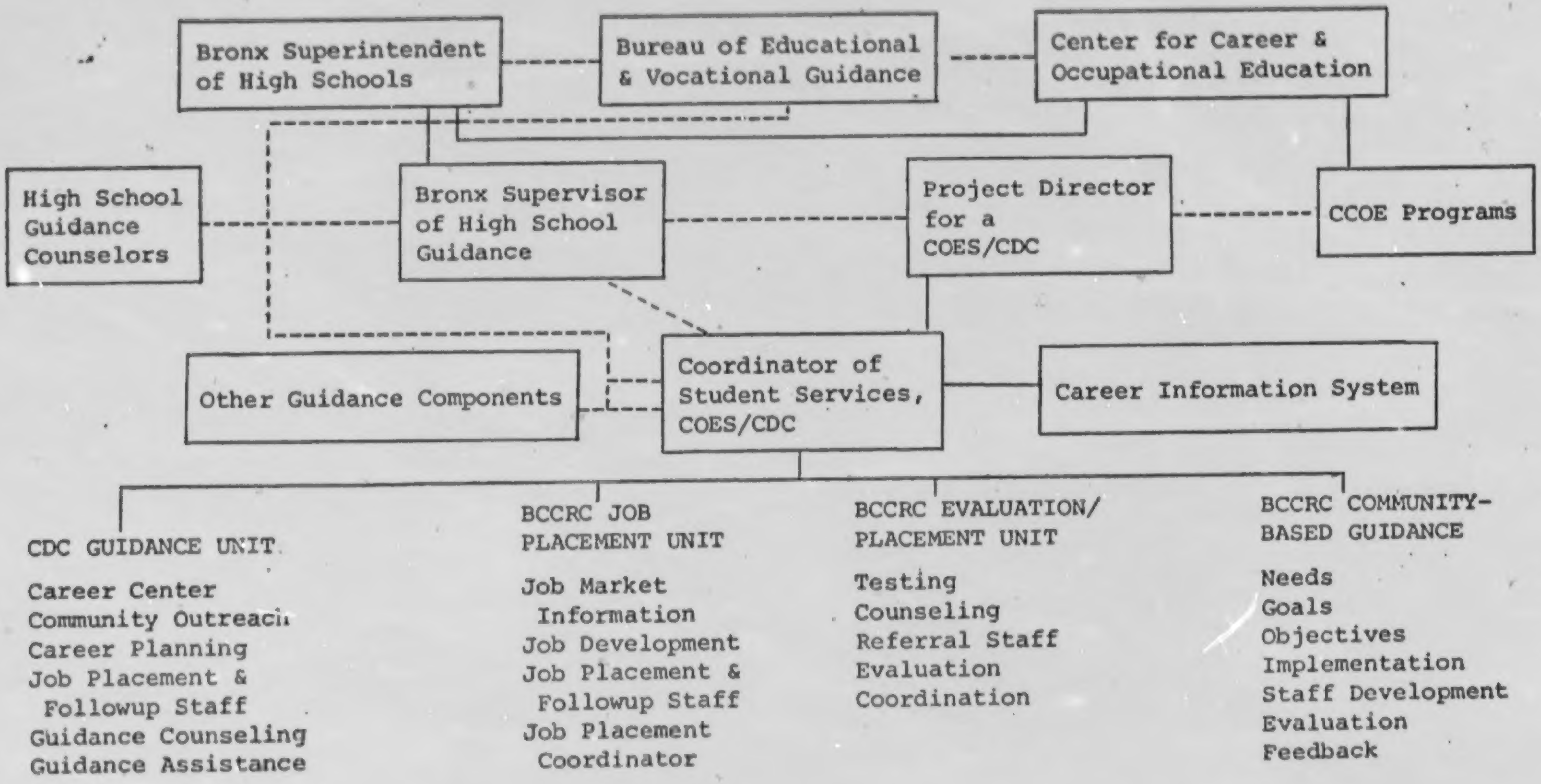
3.2.1 Organizational Structure for the COES Guidance System

This organizational design for an occupational guidance system adds specific details to the guidance model outlined in section 3.5.4 ("The Guidance Program"). The key person in the implementation of that model would be the Coordinator of Student Services for the COES. This person would be responsible for providing leadership to all occupational guidance activities (see Figure 3.3.) His responsibilities would include, in addition to those cited above:

- becoming an integral part of the leadership staff of COES;
- working to establish a cooperative and articulated relationship between COES and the existing guidance structure in the regular school setting;

Figure 3.3

An Administrative Structure for Occupational Guidance for the COES and CDC


Bronx Superintendent of High Schools
Bureau of Educational & Vocational Guidance
Center for Career & Occupational Education
High School Guidance Counselors
Bronx Supervisor of High School Guidance
Project Director for a COES/CDC
CCOE Programs
Other Guidance Components
Coordinator of Student Services, COES/CDC
Career Information System
CDC GUIDANCE UNIT
Career Center
Community Outreach
Career Planning
Job Placement & Followup Staff
Guidance Counseling
Guidance Assistance
BCCRC JOB PLACEMENT UNIT
Job Market Information
Job Development
Job Placement & Followup Staff
Job Placement Coordinator
BCCRC EVALUATION/ PLACEMENT UNIT
Testing
Counseling
Referral Staff
Evaluation
Coordination
BCCRC COMMUNITY-BASED GUIDANCE
Needs
Goals
Objectives
Implementation
Staff Development
Evaluation
Feedback

- servicing all the existing occupational guidance elements; and
- developing those additional elements necessary to fill in any gaps in the design.

An important building block of the COES occupational guidance structure is already in place in the Bronx. That component is the Bronx Career Counseling and Resource Center (see Figure 3.3 and section 3.5.4). All of the elements outlined above are related in some form or other to the work of this Center. It would become the responsibility of the Coordinator of Student Services to integrate the work of this center into the COES. This should permit the Bronx Career Center to broaden the form of its activity to fit the wide objectives of the comprehensive system. In many respects, the framework is already functioning at the Center; however, that framework must be redefined in terms of the broader scope applicable to the COES.

It would be the direct responsibility of the Coordinator of Student Services to implement a process for examining the occupational guidance needs of the Bronx, establish goals to service those needs, and structure/implement a broadly based approach for meeting those goals. The process would include the following:

Step 1: Organization of a guidance subcommittee of the Bronx Occupational Education Advisory Commission. This subcommittee should include representatives of occupational education and regular school personnel, parents, students, community agencies, business, etc.

Step 2: The sub-committee should be presented with an occupational guidance needs assessment and a review of existing services for young people and adults.

Step 3: Based on the needs assessment, a series of goals and objectives should be developed for occupational guidance in the COES, along with an implementation plan.

Step 4: An evaluation design based on the stated goals should then be developed.

The subcommittee's work should be a continuing effort, such that occupational education activities can be continuously examined and revitalized. One product of this approach would be the development of process documents and "how-to" manuals in specific areas (e.g., articulation of occupational education with the middle schools; drop-out prevention through occupational education; orientation procedures for incoming freshmen, etc.).

3.3 ELEMENTS OF THE COES

A Comprehensive Occupational Education System would include four major elements:

- a career awareness program (K-6);
- an exploration program (7-9);
- occupational education programs in the high schools; and
- occupational education programs for adults and out-of-school youth.

3.3.1 Career Awareness Program (K-6)

In the early grades, children need help in developing attitudes and knowledge from which a healthy evaluation of self and a proper appreciation of the value of work can emerge. Academic programs should include career possibilities as they relate to social studies, science and mathematics. Field trips and visits to the school by business and community members help to expand the child's world and interests.

3.3.2 Career Exploration Program (7-9)

At this level all students should participate in programs which explore, in some depth, two or more broad career clusters. The major objective of the 7-9th grade exploratory program would be to develop in each student an awareness of the broad variety of occupational options, as well as the characteristics and employability criteria for various job areas. This program would also develop an understanding of the kinds of jobs available, the skills required to be successful in individual occupations, and the programs available at the high school level through which students may acquire entry-level job skills (or may enter high school programs required for training in post-secondary schools).

In addition, the 9th year program would provide students the opportunity for in-depth exploration of the occupational alternatives available to them. This exploratory program would differ from that offered in the 7th and 8th grades in that its objectives would be: (a) to help students develop an understanding of the specific occupations open to them; and (b) to help them select that occupation or occupational cluster in which they would like to pursue further training.[1]

3.3.3 Occupational Education Programs in the High Schools

Basic to the career education concept is the assumption, indeed the insistence, that every high school graduate (the college bound as well as employment bound) should leave school with the ability to earn his way. Regardless of the student's ultimate career goal, by this stage of his development he should be equipped with a marketable entry-level skill -- one which can assure immediate employment or which can be applied toward an advanced or professional degree.

The high school occupational education programs would consist of three interrelated elements: exploration, pre-vocational training and vocational (high-skill) training. The first of these would provide for exploration in those occupational areas for which training is available in the high schools. It would serve as the basis for the selection of appropriate occupational training programs.

The pre-vocational training program would begin the development of specific occupational skills which are common to broad groups of occupations, and which would also serve as the basis for the development of advanced skills to be gained through further training. The vocational training program would provide high-skill training in one occupational trade or multi-trade area e.g., electric/electronics). It would offer all high school students (both college bound and those who will seek employment immediately after high school) the opportunity to develop salable skills, either for entry-level or upgraded employment.

3.3.4 Occupational Education Programs for Adults and Out-of-School Youth

This program would allow adults and out-of-school youth to acquire the skills necessary for entry-level employment or for upgraded employment.

3.4 COORDINATION OF COES ELEMENTS

The elements of the COES, as described in the preceding section, comprise a continuum requiring coordination for successful implementation -- coordination within, as well as between each of these elements.

3.4.1 Pre-High School Elements

In order to implement this plan, occupational training must be centrally coordinated. Once the decision is made to implement the plan, efforts in this area must commence early in the student's education through the organization of additional workshops for elementary teachers. Such a program would facilitate the infusion of career awareness elements into pupil lessons. Regarding the 7th and 8th year programs, a major effort must be made to standardize and expand a more comprehensive exploratory program, since the existing program is neither adequate nor uniform among different schools.

The 7th and 8th year programs would offer students an opportunity to explore occupations, in order to develop an awareness of their occupational options. This would require facilities and resources adequate for a program consisting of laboratory experiences, classroom study in career and occupational options, and field trips, as well as related activities designed to develop an understanding of the world of work. However, most 7th and 8th grade students attend schools with shops which are inadequate for providing laboratory experiences.

(Even where sufficient space exists, many schools do not have this physical capability.)

Thus conditions do not presently permit such an array of activities. Furthermore, it is economically impossible to develop this capability at each school. However, by establishing mobile teams equipped with multi-media equipment and portable kits for hands-on assessment/awareness and exploratory programs, this goal could be met with limited fiscal expense. These teams would be organized according to clusters and would be staffed by (a) teachers and (b) para-professionals trained to assist teachers in developing classroom lessons and planning field trips pertaining to a particular cluster. The teams would also provide students with hands-on experiences. These teams would be centrally coordinated and would have responsibility for coordinating their visits with school principals.

The 9th year career exploratory program would be required for all students. Its major goal would be to assure each student an opportunity for in-depth exploration of the occupational alternatives available to him in three to five cluster areas, based on the student's exploration experiences in the 7th and 8th year programs. This phase would also derive additional support from mobile teams, which would supplement the capabilities of the respective schools.

3.4.2 High School Elements

The high school exploration program would be offered in all high schools -- academic/comprehensive, vocational and specialized. Ideally, this program would be available to all students in their home schools and would provide for exploration in all areas of occupational training available on the secondary level. When exploration in a particular area is not available in the home school, the student would be able to participate through the Shared Instruction Program or the Career Development Center.

The high school pre-vocational program would be offered to all students in their home schools. Since the purpose of the program is to provide specific skills common to broad groups of occupations, the courses would be broad in scope and would offer training in basic skills that apply to a wide variety of related occupations. In the academic/comprehensive high schools, this program would offer training related to all occupational areas available on the secondary level. In the vocational high schools, the pre-vocational program would be directed toward developing specific skills related to occupational programs offered in the vocational high schools.

The vocational (high-skill) program would offer all high school students two basic alternatives for high-skill training: a vocational high school program or a high-skill training program in the academic/comprehensive high schools. The vocational high school program would be much the same as the current vocational program, with a three-year sequence of trade training. The only changes would be those aimed at improving the flexibility of the current vocational program.

The single trade concept, which currently prevails, would be replaced by multi-trade programs (e.g., electrical/electronics, automotive/machine shop), some of which are presently in use. These would provide concurrent study in more than one trade area. Upon completion of the 12th year, the student would have the skills to qualify for employment in several related occupations.

The vocational high schools, which are zoned city-wide, would institute standardized admissions procedures which would allow a student to apply for a particular program rather than a particular school. Even when the student enters in the 9th grade and is enrolled solely in the exploration program, this innovation would enable him to take the admission tests for any of the vocational programs in any of the vocational high schools. In addition to standardizing admissions procedures and testing, courses of instruction would also be standardized, which would allow students to transfer between schools without penalty.

The vocational programs in the academic/comprehensive high schools would offer students three options:

(1) Students attending academic/comprehensive schools with occupational training programs in the areas in which they were interested would be able to take occupational training in their home schools.

(2) Students could enroll in the Shared Instruction Program and take a course in a receiving school.

(3) Students could attend classes at the Career Development Center.

In order to make the high school vocational (high-skill) program flexible, it would be necessary to (a) change to a modular or similar system for unit skill training, or (b) offer instruction as part of occupational clusters. These changes would allow students maximum flexibility relative to a variety of options, as well as an opportunity to acquire an entry-level skill at the conclusion of each option. The modular system would permit students to acquire a skill in a single field or to follow an interdisciplinary program of skill training.

The cluster concept, as developed in Philadelphia and other urban centers, is recommended as a basic concept for curriculum development and instruction in a Comprehensive Occupational Education System. It is particularly appropriate to the Career Development Center. The cluster concept is based on the fact that many occupations require common skills which are transferable from one occupation to another. By clustering courses around these common skills, the student would be prepared for several occupations within a cluster.

The clustering approach also features the concept of "non-failure," i.e., students progress at their own pace (utilizing individualized instruction) to the skill level appropriate to their ability and career plans. If conditions in the labor market alter during a student's training, he can readily change from one occupation to another within a cluster. In addition, the cluster concept would allow the Comprehensive Occupational Education System to change with changing conditions in the labor market. (The clustering concept is discussed in greater detail in the section dealing with curriculum development.)

3.4.3 Occupational and Vocational Programs for Adults and Out-of-School Youth

The Center for Career and Occupational Education, as well as other public and private agencies, provides occupational training for adults and out-of-school youth. Such programs require coordination in order to avoid duplication of services and to better provide for the individual needs of these populations. A COES would allow for coordination of efforts and, furthermore, would provide the additional training and support services required to meet the needs of these populations, particularly through a Career Development Center.

3.4.4 Articulation Between the Secondary Level and the "Next Step"

An important aspect of any comprehensive educational system is continuity between its separate elements. Linkages exist between the elementary, middle and secondary levels of the public school system in the form of continuity in curriculum planning, as well as communication between the personnel responsible for the delivery of services at each of these levels. Similarly, planning and communication must be extended into the adult training domain, if we expect to provide comprehensive career education services to all levels of our population.

(see ATTACHMENT G for a Description of an articulation process)

3.5 COMPONENTS OF THE COES

A Comprehensive Occupational Education System in the Bronx would be a resource and information umbrella under which services and support of occupational education would be delivered. The following pages describe the major additions to, or revisions of components of the existing occupational delivery system required for a COES in the Bronx. Functions of the system would include:

(a) to coordinate and support existing occupational education by:

- making accessible a Centralized Information System to all component parts of the COES;
- providing curriculum development resources;
- providing staff development and training; and
- providing guidance and counseling support.

(b) to augment programs already in existence in each of these areas by:

- providing specific training designed to complement existing courses available; and
- providing necessary services which are presently nonexistent, or which serve only limited populations.

3.5.1 Centralized Information System

A Comprehensive Occupational Education System in the Bronx should utilize a Centralized Information System to provide informational linkages between programs, professionals and students. These linkages would integrate presently discrete schools and programs into one system.

Although these individual components of the COES would retain their unique characteristics, the courses and programs would be unified conceptually. Such unification would allow greater utilization of occupational skills training opportunities such that, during intake procedures, students would have the entire range of options presented to them at one time and in one place. In addition, program administrators would be able to monitor the utilization of programs within the total system through the Centralized Information System (CIS).

The CIS is conceived as two sub-systems, referred to as the "Career Guidance Information System" (CGIS) and the "Management Information System" (MIS). Each subsystem could and would be developed on a stand-alone basis. However, they would also be designed to provide for eventual linkage with the New York Educational Information System (NYEIS).

The CGIS would consist of four parts: (1) educational and program opportunities; (2) career information; (3) placement information; and (4) human resources information. This system would build upon existing sources of career information which are serving particular populations. These include information activities of units of the Bureau of Educational and Vocational Guidance and the Center for Career and Occupational Education. The CGIS should concern itself with the development and refinement of information for each of the data banks, as follows:

Educational Opportunities Data Bank. This data bank would provide updated material on educationl and occupational training programs in the public high schools, alternative schools, private and parochial schools, and private trade schools, as well as special programs for the handicapped, bilingual, etc. It would cover a range of areas in both the public and private sectors, on various educational levels, and would deal with the entire metropolitan area.

Career Decision Making Data Bank. This information bank would provide for career exploration. It would combine the work of the counselor in individual and group counseling, related career inventories and manuals, and stored career information, in order to form a developmental program. The information could be catalogued by interest areas, aptitudes, worker traits and/or educational levels, depending upon the nature of the computerized program chosen.

Job Placement Data Bank. This would provide localized and area-wide job market information, including data on job market trends in the region and its surrounding area, skills needed for specific jobs, listings of actual part-time or full-time paid job opportunities, and listings of volunteer and non-paid work experiences.

Human Resources Data Bank. This bank would list and update all ancillary services which students need to function effectively during training or while on the job. This would include public and private sector activity in legal services, medical and psychological resources, housing, day care, welfare, etc.

* * * * *

The CGIS would be computerized and make use of the most recently developed forms of that technology. Some elements of the system may be manually operated, in order to permit early implementation or due to cost factors. (Care should be taken to make the manual system compatible with any computerized functions, to permit easy changeover.)

The above combination of data banks would make available a single source of information in an efficient manner. It would give guidance personnel a wider range of choices to present to their clients and would assist in increasing the flow of information to greater and more varied populations.

The Career Guidance Information unit would participate in the implementation and continuous updating of the guidance data banks as components of the Centralized Information System. It would be concerned with preparing and editing the material from the point of view of its utilization as a guidance tool. It would also service individual occupational guidance units by assisting in the planning and implementation of career information centers. These centers would utilize the expertise and the resources of the COES in developing their own localized operation, with emphasis on the clusters for which students were being trained within the individual units of the COES.

Research has indicated that the most successful approach to the implementation and management of a career guidance information system is the consortium design. The major strength of the consortium is the involvement of a wide range of agencies and institutions. This improves the quality of data input, as well as the cost effectiveness and quality of utilization, due to staff development possibilities.

The COES Coordinator of Student Services should initiate the Career Guidance Information consortium and integrate it into the work of the COES. Following are the suggested developmental phases for such a Career Information System.

Phase 1: Development

- Form a steering committee to lay the groundwork for a consortium. The steering committee should include representatives from institutions currently involved in career information efforts, as well as potential users (CCOE, BEVG, Human Resources Administration, Bureau of Labor Statistics, Manpower agencies, CUNY, etc.). The steering committee would represent agencies in the greater metropolitan area, and would include appropriate adjacent areas of Connecticut, Westchester County, New Jersey and Long Island.
- Research existing career information systems and present the steering committee with alternative proposals for a pilot project in the metropolitan area.
- Develop plans based on the above for the implementation of a consortium and a pilot project during Phase 2.
- Seek out funds for the pilot project.

Phase 2: Pilot Project

- Place a pilot delivery system on a local computer and demonstrate to potential users.
- Implement the system in selected local schools and agencies on a pilot basis.
- Begin to localize the information by input of regional information.
- Formally establish a consortium.
- Develop plans for the full implementation of the system, including:

  clients - determine which users and geographic areas would be serviced;

information development - information which will be localized during the first year;

financing - a plan for financial independence of the system, including the implementation budget; and

staffing - develop a plan for staffing during the implementation period.

Phase 3: Implementation

- Full implementation of a staff devoted to information development, data processing and user services.
- Full-scale "marketing" of services to local educational and social agencies.
- Full-scale implementation of user services, including staff training, etc.
- Full localization of information in all areas based on the functioning Information Development Unit.

Phase 4: Continued Development and Expansion

- The system becomes financially self-sufficient.
- User subscription increases.
- Operating functions are refined and expanded, based on evaluation results.

* * * * *

The Management Information System (MIS) would collect personal information for every student (name, address, ID number, school, birthdate, courses in which enrolled, grades, placement outcomes, etc.) and, whenever possible, would use NYEIS hardware and software packages.

The MIS would serve a variety of managerial and guidance purposes. Managerially, the system could serve as an aide to scheduling, attendance accounting, grade reporting, and program evaluation. As a guidance tool, the information could be used to monitor and evaluate a student's progress as he moves through the system.

For all students incorporated into the system files, it would enable system administrators to know, for example, the percentage and number of students pursuing discrete courses of study, as well as the training and/or placement outcomes of those educational experiences. It would also aid in any effort at longitudinal evaluation of student performance and course effectiveness.

The first stage in the implementation of the MIS would entail the integration of existing systems (the computerized programming system which is in place in several schools and relevant data collected by the Office of Educational Statistics) into the MIS, and the production of a master course list. With the completion of this stage, gaps in existing data bases would become apparent and the necessary work to fill those gaps can begin. The full on-line capability of the pupil system would be completed during this stage.

An integrated partial system would result in a "prototypical model" for the maintenance and collection of data for managing and evaluating occupational education programs. Stage two of implementation would initiate the complete MIS at the beginning of the second year. By the end of the second year the MIS sub-system would be fully operational.

3.5.2 Curriculum Development

In New York City, vocational high schools offer three year sequential trade programs designed to meet the needs of students who, having made an early career choice at the end of 8th or 9th grade, elect to pursue a single trade program. However, such programs are not flexible enough to permit either new entrants or transfers from other trade areas to enroll after the first year. In an effort to overcome the inflexibility of trade programs within such a sequential framework, some multi-trade programs (e.g., electrical/electronics, automotive/machine shop) have been structured to provide concurrent study in more than one trade area.

In comprehensive high schools, students are offered one- and two-year sequential occupational training programs in a variety of trade areas. In addition, the Shared Instruction Program and After School Occupational Skills Program offer training in units resembling modules in a number of trades.

The major shortcoming of sequentially-ordered occupational delivery is its inflexibility in terms of the three year-sequence and the single trade approach. The student is forced to make a lengthy investment of time in order to emerge from the program with a specific job-related skill. Moreover, having made a change in career choice different from the one in which he or she is embarked, the student is unable to enroll in another trade area after the first year. The inability of students to enter into flexible short-term job training programs curtails and discourages student vocational interest and deprives them of opportunities to select from a wide range of career choices. It is well-known, and important to note here, that students in the 10th, 11th and 12th grades frequently make changes in career choices, since they are undifferentiated as to what trade they wish to follow, have a paucity of information about various trades, and are subject to rapid and dynamic changes in the job market. Furthermore, if a student is forced into the labor market before the 12th year sequence due to economic dislocation or other reasons, he or she should have acquired sufficient marketable skill segments to be able to qualify for a job. Under the present trade training program, this is the case.

Efforts to combat these problems include the use of individualized instruction, changing the conventional role of the teacher (to that of a manager of learning), the introduction of open entry/open exit curricula (organized in clusters and delivered through modules), and the use of this clustering concept.

The Clustering Approach

The concept of clustering is based upon dramatic changes taking place in the composition of the work force brought about by automation, technological modifications, productivity requirements, and changes in product lines -- all of which have a direct impact on job skills and requirements. As a result, today's worker must be a flexible entity and must possess the ability to adapt to a rapidly changing and somewhat unpredictable work environment.

Research projects in the area of job clustering have great potential for helping educational planners perceive a variety of skills which vocational education should be promoting and pursuing through instructional programs. Job analysis, an important and vital part of clustering research, can provide a wealth of information regarding job duties, skills and other related requirements necessary to perform not only in one job, but in a related group of jobs constituting a family of occupations. Job analysis can also provide information on jobs not only in the same family of occupations, but also those involving comparable skills and duties in another family of occupations. The more data obtained on clustering and reflected in courses in vocational education, the more one is assured of helping students acquire a variety of related trade skills and thus providing them with optimum opportunities for qualifying for jobs (or retaining a job) in which changes in duties and job skills have taken place.

The major aim of the cluster system, therefore, is to enhance job flexibility and employability of the prospective worker for a variety of jobs. The rationale for the cluster concept has several component parts, as follows.

1. It is important that vocational education be constantly aware of the fact that changing technology requires several changes of usable skills during the working life of job holders. The fact that jobs are rapidly changing (with some becoming obsolete) supports the notion that students should acquire a variety of trade skills applicable to a number of jobs.

2. There is a need to determine entry-level skills for a variety of related occupations. The cluster approach presupposes job entry at skill ladder levels in which cluster contents should reflect

common skill characteristics necessary for career mobility in the labor market.

3. It has been shown that over 50% of the American work force take jobs in locations other than where they graduated from school. The instability of career or job choice commitments of secondary school youth necessitates that vocational curricula provide the student with a number of trade options.

Based on the foregoing, it is concluded that the merits of job clustering are the following:

- The broad trade skill experience offered by a job clustered curriculum prepares the student for a family of related occupations, rather than for a specific occupation.
- The cluster approach breaks down the rigid barriers which exist between the different trade skill areas of vocational education. Job clustering forces the identification of common skills across a number of trade areas.
- The hierarchy of skills is structured in such a way that the student completing a cluster curriculum will be able to advance more rapidly up a career ladder.
- A curriculum developed in this manner provides more relevance for students interested in a variety of occupations within an industry rather than a specific job. A student may also defer his final career decision until after he has experienced a variety of related jobs.

The concept of the cluster curriculum in vocational education based upon families of occupations is practical and workable. However, it is paramount that instruction be relevant to specific job targets. Clearly identified target jobs for graduates of vocational cluster curricula are essential. In this connection, the use of job analysis will provide the data and information necessary to identify target jobs.

Open Entry/Open Exit and Individualized Instruction

The open entry/open exit approach was designed to allow students to enter into, and exit from training at almost any time. It is currently being used in the Philadelphia Skill Centers, the Dallas Skyline Center, and the New York City Manpower Training Programs. This training approach makes possible what the Office of Education has referred to as "continuing and recurrent education," while it allows even those who do not wish to make a lengthy investment of time to emerge from the program with a specific job-related skill.

The overall open entry/open exit approach is based upon the concept of the "module." A module consists of forty instructional hours. Although modules within an occupational field articulate with one another, the completion of a single module is sufficient to provide the student with entry-level competence in a specific area. A module thus allows a student to gain an entry-level skill through a short-term learning situation rather than his making a commitment of several years, as is currently the case. If the student finds himself ill-suited to the particular subject in which he is enrolled, he may complete only one module and move to another occupational area. In such cases, the student will have lost little (and will have gained a marketable skill in the process).

An important innovation in the model is the free-standing nature of the curriculum. This means that there are no specific prerequisites for entry into any of the modules. For many students, this provides the opportunity to change fields without having to backtrack and take a series of courses only marginally related to the area of interest. For those who may have real life experience in a particular skill area, it provides a learning situation tailored to individual needs and background.

The foregoing characteristics combine to form a model which is both learner-centered and responsive to the realistic demands of today's labor market. In terms of the student, it clarifies the relationship between school and work, establishing realistic, attainable goals and providing sufficient flexibility for individualized programs. In terms of the labor market, it provides a supply of trained entry-level workers who are able to function competently in specific skill areas. As contrasted with the traditional curriculum model, then, the modular curriculum is learner-centered, free-standing, job-related and designed as an open entry/open exit system.

Performance objectives for individual courses were developed in Philadelphia by a panel representing industry and the trades. A similar approach was utilized in Dallas, while the New York City Manpower Training Program relied on a group of teachers for identification of performance objectives.

The use of time frames seems to be inappropriate in delivery systems employing the open entry/open exit approach, and tends to directly conflict with the goal of increased flexibility. Unless time frames are modified and adjusted to accommodate the open entry/open exit approach, they will continue to be inappropriate.

In Philadelphia, students are assigned to the Skill Center for a given time and are permitted to complete as many modules of instruction as possible. Students are tested when they feel they can meet the performance objectives. If they are successful, they proceed to the next module of instruction. Time is considered to be a free variable and is not used as a training factor. Completion of each module reflects a demonstration of competence in the entry-level tasks for which instruction has been received.

The Dallas Skyline Career Development Center has a very similar system, while the New York City Manpower Training Program relies on maximum allowable hours of instruction as determined by the D.O.T. (required by established procedures) for reimbursement by the federal government.

3.5.3 Staff Development and Training

Occupational training is one of the most drastically changing areas in education. Educational changes corresponding to rapid technological changes taking place in the industries concerned, coupled with fiscal limitations, result in shops and equipment often being out of date, as well as vocational and industrial arts teachers who have difficulty keeping up with the changing technology in their respective trade areas. These facts point out the special need for ongoing staff development efforts for occupational teachers.

All teachers, as professionals, need to keep abreast of the results of current educational research and new approaches to learning (such as self-paced instruction, short-unit instruction, and audio-visual techniques). These should be explored and, wherever possible, utilized by occupational subject teachers to promote a climate more conducive to learning. This could most effectively be accomplished through a "Teacher Center for Occupational Education." Such a program could be housed within the Career Development Center. (This will be discussed in greater detail in the following pages.)

The Center for Career and Occupational Education, in cooperation with the Division of High Schools, now provides for, and assists in the development of, in-service training programs for career and occupational education teachers and administrators. Examples of such efforts include a conference for vocational high school principals held in January 1977, and an in-service class for electromechanical teachers.

At present, the responsibility for staff development rests with the Assistant Superintendent and with school principals, along with the Center for Career and Occupational Education and its offices (Business Education, Trade and Technical Education, Home Economics, Industrial Arts, and Health Education). While a staff development capability exists, one finds in practice that training, when it does take place, is not planned. Due to the lack of coordination, those in the field know less than they should about the resources available to them.

The logical, efficient way to identify and deliver needed services is as part of a Comprehensive Occupational

Education System, the major function of which would be to coordinate all efforts toward delivering occupational education in New York City. In order to have a comprehensive plan for staff development and training, it is necessary to provide for:

- ongoing in-service and staff development programs;
- a resource center for occupational education; and
- cooperative education/industry efforts which would:
  - permit teachers to spend time in industry to update skills and gain knowledge of current practices and procedures;
  - provide for the loan of experts from industry to serve as guest teachers and in-service instructors; and
  - coordinate industry workshops for teachers.

A system providing such functions would not only allow teachers to maintain and upgrade their skills and acquire occupational information, but would also give them an opportunity to observe new trends and to update curriculum in accordance with employer needs.

The Economic Development Council has been working with several schools in the Bronx in an effort to improve professional development through their school renewal program. The focus has not been on occupational staff development, but rather on providing professional development and professional support to school staff. This model is applicable as a prototype for a "Teacher Center for Occupational Education" as a component of the COES. The major goals of the Teacher Center would be:

- to provide relevant professional development opportunities for occupational teachers within each school through a program of in-service and staff retraining and upgrading;
- to provide a central, accessible resource center which would make available professional literature and research results;

- to provide professional assistance to school administrators and teachers in applying new concepts and techniques in the development of more effective educational programs and classroom instruction.

The Teacher Center for Occupational Education would fulfill these functions by:

- providing an educational resource center for teachers;
- providing assistance in planning and developing in-service programs and upgrading programs;
- offering assistance in training to identify assess staff;
- rendering assistance in the development and coordination of cooperative efforts by business, industry and labor to provide staff upgrading, in-service and exchange programs; and
- serving as a component of the borough-wide educational assistance team.

3.5.4 The Guidance Program

3.5.4.1 Introduction

The Comprehensive Occupational Education Research (COER) Project was to "design an administrative structure for guidance, counseling, placement and followup services for all youth and adults."[2] This would include: joint school/community planning of guidance services; researching guidance staffing patterns; planning for staff development; and researching and developing a model for a comprehensive job placement and followup service.

The COER Project addressed itself to both an urban area occupational guidance service for a Comprehensive Occupational Education System, and an individual guidance unit in a Career Development Center. (The latter is presented in Chapter Four.)

Recently voiced concerns among vocational educators for increasing occupational guidance support services have included recommendations for:

- a career guidance information system to provide updated information on existing occupational training opportunities;
- greater flexibility in admissions policy (i.e., admissions for other than the traditional September-June school year);
- assistance in student movement within the system when career plans change;
- staff development for personnel in the area of occupational guidance;
- the development of other supportive services to assist young men and women in continuing their occupational training;
- a centralized job placement unit; and
- a centralized vocational evaluation unit for assisting students in making career choices.

The model presented here is derived from an amalgam of factors flowing from the process in which the COER Project became involved during the course of this study. These included the following:

- an examination of the goals and objectives of the project;
- an examination of occupational guidance needs in the New York metropolitan area;
- a review of the literature on existing occupational guidance programs;
- on-site visits to different programs which share similar goals;
- development of a series of monographs on selected programs visited and researched; and
- development of a model occupational guidance structure for a comprehensive occupational delivery system.

This model represents a combination of two distinct components -- an individual guidance unit at the Career Development Center (discussed in Chapter Four), and the subject of this section, an urban area occupational guidance system to function as part of a Comprehensive Occupational Education System.

3.5.4.2 The Current Situation

The COER Project conducted five surveys of varied populations in the Bronx to ascertain occupational interests. Four of these included questions on where career information was obtained in the past, and where one would go for future information. These four questionnaires were administered to long-term high school absentees, regular academic/comprehensive high school students, intermediate/junior high school graduates, and high school parents (see Table 3.1).

The three surveys directed at the high school populations and/or their parents indicated that roughly 17% of the respondents obtained their career information from guidance counselors; the corresponding figure for the junior high survey was better, at 24%. Parents/guardians made a strong showing as career information sources, falling within a range of 24-36.9%. (The 36.9% corresponds, naturally enough, to the parents' appraisal of their own input.) Teachers were ranked surprisingly low as sources of information, ranging from 7.8 to 15.4%.

In all cases, the percentage of respondents who would go to guidance counselors in the future for career information was much higher than the figure indicated for past

Table 3.1

"Where did you get the most information about the career in which you are interested?"

	HS Survey		Junior High Survey		Drop-out Survey		Parental Survey	
	no.	%	no.	%	no.	%	no.	%
Parents or Guardians	576	26.4	180	24.1	71	24.7	150	36.9
Neighbors	21	1.0	8	1.1	2	0.7	*	
Friends	299	13.7	94	12.6	51	17.7	21	5.2
Teachers	335	15.4	58	7.8	21	7.3	48	11.8
Guidance Counselors	380	17.4	180	24.1	47	16.3	69	17.0
Other	452	20.7	169	22.6	74	25.7	33	8.1

*This question not asked of parents.

practice. This ranged from 35.1% for dropouts, to 79.6% for parents (see Table 3.2). This trend must be taken into consideration in any future planning for sources of career information.

This demand for guidance services should be viewed in light of what actually exists in New York City. In December 1975, there were approximately 450 full-time high school counselors in the city, serving a high school population of 320,000 (a ratio of 1:710).[3] The intermediate/junior high schools had a counselor/student ratio of 1:921 for the same period. These figures stand in sharp contrast to the American Personnel and Guidance Association's recommended ratio of 1:250.

The end result of these high counselor/student ratios is that many students remain unaware of alternate settings, trade courses, educational options, etc. which are available to them. This situation is all the more unfortunate in that it remains in effect during a crucial period, when the student must make career and educational decisions based on inadequate information. As one Bronx high school principal reported: "We ... are very concerned over the way applications from feeder schools have come to us; some [are] not completely filled out and many, we feel, may not be properly directed, since there were no counselors to advise the students."[4]

In the same report, a junior high principal from the Bronx is quoted as stating that, "Graduating students have had very little opportunity to discuss the selection of a high school with a trained counselor. This has affected and limited their ability to choose an appropriate high school curriculum."[5]

Table 3.2

"Where would you go to get career information (in the future)?"

	HS Survey		Junior High Survey		Drop-out Survey		Parental Survey	
	no.	%	no.	%	no.	%	no.	%
Parents or Guardians	671	30.8	309	41.4	113	39.2	*	
Neighbors	8	0.4	2	0.3	1	0.3	1	0.2
Friends	83	9.0	22	2.9	16	5.6	3	0.7
Teachers	189	8.7	45	6.0	9	3.1	18	4.4
Guidance Counselors	946	43.4	299	40.0	101	35.1	324	79.6
Other	205	9.4	33	4.4	26	9.0	15	3.7
		**						

*This question not asked of parents.

**Totals do not sum to 100% due to invalid checking.

In the way of solutions to the problem, the Bureau of Educational and Vocational Guidance (BEVG) has developed an extensive articulation process between the intermediate/ junior high schools and the high schools. Their efforts include the annual publication of the Directory of Public High Schools, as well as articulation conferences and regular memoranda describing available programs.

However, these guidance efforts cannot exert their intended influence upon students, since actual implementation comes at the hands of overworked counselors. Any model for occupational guidance must therefore address this problem of counselors with huge case loads.

3.5.4.3 A Guidance System for the COES

The function of the COES occupational guidance system would be to provide supportive services to occupational education in the metropolitan area. Its work would be integrated with that of the Bureau of Educational and Vocational Guidance (BEVG), to achieve full use of existing resources and energies.

Prior experiences have indicated that the success of any occupational guidance system depends upon cooperation among educational agencies and personnel, community agencies and groups, industry/labor, and the academic community. The occupational guidance system should involve all of the above in cooperatively defining the occupational guidance role, in establishing goals and objectives, and in developing an accountability approach for measuring the attainment of these objectives. This would permit the system to continuously re-examine itself based on the results obtained. The major purpose would be to offer personnel an opportunity to scrutinize their activity in occupational guidance on an ongoing basis through the use of measurable objectives. The results of this examination would be fed back into the system for a re-evaluation of goals, objectives and activities.

A variety of people would be involved in this process, including occupational guidance practitioners on both the COES and unit levels, other occupational education agencies, advisory commission members, and parent/student representatives. They would provide the guidance system with a sounding board as to community attitudes and feelings. They would also give the consumer/client a closer tie to the guidance service.

The system's design would be that of a community-based program, involving interaction with the environment and the population it serves. The model includes the following elements:

- assessment of:
  - student needs and interests;
  - community needs and attitudes;
  - available resources;
- planning and organization, including specification of measurable objectives and strategies to respond to each identified objective;
- scheduling which permits full utilization of appropriate resources; and
- evaluation and programmatic restructuring based on outcomes.

The practical implications of the projected model include the following:

- The occupational guidance staff would be involved on a number of organizational levels in a joint effort with the community and the consumer/client. This would permit the guidance component to properly reflect the needs of the community and permit the consumer/client to better identify with the guidance counselor.

- The occupational guidance staff would develop a specific set of goals and objectives, an implementation plan, and a process for evaluating the results for feedback into the system. This would assure that new ideas are constantly being introduced, thus keeping the system in tune with the needs of the consumer/client.
- A step-by-step blueprint of the accountability model would be developed by the participants.

The COES occupational guidance system should include the following three units:

- a Career Information System;
- an Occupational Evaluation and Placement Unit; and
- a Job Development and Followup Unit.

The guidance system would serve as the hub around which all activities of these units will flow. These operational units would be developed according to community-based approaches, as outlined above, and would serve as models for other locations within the comprehensive system. The major units of the guidance system are described in the following pages.

The Career Guidance Information System, as discussed under the Centralized Information System in section 3.5.1, would tie together and give a centralized focus to career information. It would service the COES and the individual occupational education units within same with a constant flow of information in four basic areas: educational opportunities, career decision making, job placement information, and human resources information.

Occupational Evaluation and Placement Unit

A second element of the community-based approach involves large numbers of youth and adults in urban communities who are in need of direction in career decision-making, as well as assistance in finding appropriate services and placement in occupational training programs. In order to round out the services of a comprehensive occupational education system, there should be a unit which is capable of accepting referral services for this population.

The unit should be geared to an intake process which permits ready access to its facilities and services. This aspect should include an easily accessible, attractice facility, flexible scheduling, and rapid intake procedures. The clients should feel that they are dealing with an organization with a minimum of institutional red tape, which can provide new ideas or referrals to training programs / service agencies, based on individual need.

The counseling process should include an assessment of educational achievements, aptitudes, and personal traits/interests. Assessment practices should reflect the individual differences of varied populations and their needs. The unit would utilize components of the Career Information System, as outlined earlier. Clients should be able to become involved in career exploration, becoming familiar with available training programs and the job market before making their decisions. Group activities should complement individual activities, to add the benefits of interaction between people.

The evaluation unit should become expert on the resources available, and should be able to move people into appropriate occupational training programs, educational institutions, and/or other services which can assist clients in dealing with their environments.

This component of the COES is already in place at the Bronx Career Counseling and Resource Center. The Center currently accepts the referral of youth and adults into a counseling and placement process. The services of the Center should be expanded and made available to larger numbers of young people and adults under its new role as the evaluation and placement arm of this COES. These new direct ties to the COES should lead to a greater utilization of the services of the Center, particularly for relatively short-term counseling, decision-making, referral and placement.

The Center should make efforts to expand its operations so that it can service the large hard-to-reach population that exists in all urban areas. This should include the following:

- the relocation of the Center in a more readily accessible facility with a potential for more flexible hours; and
- the development of a mobile van which could travel to where the target population is located. The van should be equipped with a smaller version of a Career Information Center and be capable of instant counseling and/or referral on a "no appointment needed" basis.

Several New York models of occupational education units were studied in developing this model. They include:

The Bronx Career Counseling and Resource Center, a unit of the Center for Career and Occupational Education of the New York City Board of Education. It is located in the South Bronx and deals with a population deeply mired in the problems of urban blight. It services high school age youth and adults who are in need of career counseling. Clients go through an intake assessment and are then referred to training programs, educational settings, jobs or ancillary services. The center also has an outreach program which provides career group guidance to local schools and institutions, the use of multi-media career materials on a free loan basis, and other career related services.

Federation, Employment and Guidance Services (FEGS) has a vocational guidance division which offers vocational evaluation, counseling and psychological testing. FEGS works with a client on a relatively short-term basis for assistance in decision making or placement. If more complex problems present themselves, the client is referred for appropriate services at specialized agencies.

New Directions is a federally funded vocational rehabilitation program in Queens which is geared at young people between 16 and 25 who have been involved with drugs and/or alcohol. Its major components include vocational and educational evaluation, counseling and placement, pre-vocational training, and individual/family counseling. Specific activities include vocational testing, vocational assessment through the Singer Work Samples, pre-vocational training components, on-the-job training experiences, job placement, personal adjustment and employment counseling groups, a high school equivalency class, and referral for job training.

Job Development and Followup Unit

This unit would be responsible for correlating job market information for the comprehensive system. It would feed this information into the various occupational training units for job placement purposes. It should serve as a resource for occupational training administrators in the area of job market trends, so that programs can be responsive to the needs of the market. The unit should provide input to the job data bank of the CIS, which would include information on:

- current job trends in the region and surrounding areas;
- job market conditions in other parts of the country, with a view toward developing programs of job mobility;
- changing patterns of needed job skills, so that training facilities can alter programs; and
- specific job opportunities in full-time or part-time positions such as internships and non-paying work/study slots, volunteer programs, etc.

The Job Development Unit of the COES would work out linkages with other agencies in the region conducting similar and related operations.

The implementation of a centralized job development and placement unit would include:

- total familiarization with the day-to-day job market situation in the Bronx, including current strengths and weaknesses in various job titles;
- communication of this information to the computerized career information system as part of that operation's updating and to other components of the COES;
- establishment of a working relationship with other job development and placement units functioning in the Bronx. These would include the New York State Employment Service, FEGS (see below), Employment

and Guidance Services, Manpower Training Programs, and such CCOE units as the Shared Instruction Program and the After School Occupational Skills Program.

A logical operational location for this unit would be the Bronx Career Counseling and Resource Center. It currently deals with problems of individual clients coming to the Center for jobs and this new approach would simply mean the broadening of its activity into a centralized job development and placement unit for the Bronx which would service the total COES.

In New York, there are several models of job placement services which were studied in developing this model. They include:

Federation, Employment and Guidance Services (FEGS). Discussed above, this program offers an excellent local model. The FEGS job placement unit is the heart of their operation and their oldest division. The major emphasis of the services they provide is on employability. They have long-standing contacts with some 40,000 employers, and a room-full of job developers are constantly on the telephone keeping these contacts current. They feel that even in a weak job market, there are always jobs "out there"; they simply have to find out where they are and reach them. Special attention is given to hard-to-place persons and the handicapped. Information from this centralized unit is fed down to local FEGS placement centers which, in turn, feed localized information back into the centralized system.

The job placement division is highly organized and enjoys a good level of credibility. This is true despite the weak job market and the hard-to-place population to which FEGS delivers services.

Airco Technical Institute, in Brooklyn, is a private welding school which is a subsidiary of a major national supplier of welding equipment and materials. Several key factors are involved in the success of their placement program:

- an intimate knowledge of what is happening in the trade and where it is happening. The information is obtained through sales and marketing data funneled through the parent company. (Airco uses such devices as Dunn and Bradstreet computer printouts of metal purchasers in a given area.)
- Arrangements are made with out-of-town companies to give some assistance in moving trainees to the sites of available jobs.
- Emphasis is placed on employability factors such as promptness, shop rules and working relationships.

3.5.5 Coordination with Business, Labor, Industry and the Community

Career education, perhaps more than any other type of educational program, requires close cooperation with the community. It prepares youth and adults to enter the labor market and supplies the means for upgrading their skills. Therefore, it must be evaluated and re-evaluated by persons engaged in the various occupational fields in order to ensure that instruction is relevant.

Such objectives are most easily accomplished through the use of advisory commissions. (A description of the functions of an advisory commission, as stated in The Advisory Committee and Vocational Education, can be found in ATTACHMENT H. This section of the report will describe the efforts in New York City, as well as the efforts of groups established and contacted by the COER Project toward these ends.

Efforts in New York City and COER Project Activities

Efforts to coordinate the roles of business, industry, labor and the community formed a developmental component in planning for a Comprehensive Occupational Education System. The major objectives of these coordination efforts were to:

- assist in the development of a plan for a comprehensive occupational education system;
- coordinate, service and support occupational education throughout the system;
- assist existing programs by providing specialized training and support services; and
- assess the attitudes of business, industry, labor and the community toward the proposed delivery system.

In order to meet these objectives, the project proceeded in three separate directions: (a) surveys of students and parents; (b) organization of a steering committee comprised of representatives from business, industry, labor and community groups; and (c) establishment of the Bronx Advisory Commission on Occupational Education, which is composed of representatives of education, business, industry and labor.

The efforts of each of these groups will be discussed later in this section. First, however, it is important for us to examine existing coordination efforts in New York City.

Advisory Council for Occupational Education. This Council constitutes one of the major links the New York City Board of Education has with business, industry and labor. The Council is composed of forty commissions which represent specific vocational areas such as aviation, printing, etc. Some typical activities and/or accomplishments of the Council and its commissions, which attest to the high degree of involvement of its members, include the following:

- review of courses of study, providing suggestions for updating content to meet changing needs;
- provision of scholarships and awards which give recognition to outstanding students;
- assistance in securing part-time and summer jobs; and
- provision of expert advice on shop layouts, equipment and federal regulations.

As a member of the Bronx Commission, the Executive Secretary of the Advisory Council for Occupational Education serves as direct liaison with the Educational Advisory Commissions, business and industry leaders, organized labor, and other community groups.

As an example of what such commissions can do, we can cite the August Martin High School, which was conceived and developed by a task force composed of community, labor and industry representatives. The school is located in close proximity to John F. Kennedy International Airport and offers training in avionics. The aviation community, Federal Aviation Administration, and the Port Authority of New York and New Jersey cooperated to lend assistance and support to its programs. August Martin is an excellent example of what can be done when a school's total community becomes involved. Were it not for this total involvement, the August Martin High School would not be in existence today.

Not only have entire schools benefited from this type of cooperation, but course offerings in various schools serve as evidence of articulated industry/education alliances. The technical electronics and electricity programs at Samuel Gompers High School in the Bronx are prime examples of this type of articulation.

Samuel Gompers is a vocational-technical high school devoted mainly to the design, repair and operation of electrical and electronic equipment. Loral Electronic Systems, Inc. is working closely with Gompers by providing tours of its facilities for teachers and students. In addition, an employee is on loan to the school for assistance in course revision, updating, and improvement.

With the above cited accomplishments as examples, the

COER Project turned to the same type of community involvement to assist in its research into a plan for a Comprehensive Occupational System in New York City. Toward this end, a Steering Committee was formed, composed of representatives from industry, labor, education, government and the community at large.

The Steering Committee conducted their activities and developed their recommendations over a twelve-month period. During this time, their activities changed from those of a planning to those of a developmental nature. (Minutes of their meetings and abbreviated summaries of same are included in the Attachments. These summaries of minutes indicate the scope of Steering Committee activities and the work of its subcommittees.)

Steering Committee input was sought in numerous ways by COER staff. The Committee and its subcommittees provided input on the construction of survey instruments, the use of job market information and data, guidance and information systems, and in other areas relating to the development of a Comprehensive Occupational Education System and a Career Development Center.

Several subcommittees were formed to consider particular problems as they related to the CDC. One such subcommittee studied course offerings and, as a result, recommended courses which should be offered in the CDC. The COER Project validated these recommended course offerings by comparing them with job market results and responses to the five interest surveys discussed in other sections of this report. As a result of this process, we were able to select the courses to be included in the curricula of a CDC, should it become operational.

We should also note at this point that, while not originally represented on the Steering Committee, the United Federation of Teachers was invited to participate and provided an extremely valuable new perspective on many issues.

The Bronx Advisory Commission on Occupational Education. Eventually the Steering Committee came to feel that there was even greater need to involve business and industry in the planning process for the Project, and recommended that a Bronx Advisory Commission on Occupational Education be formed to further advance the involvement of industry, government, labor and the community, as well as to coordinate the numerous efforts in operation at the time.

The Bronx Commission was composed of representatives from:

- the Aviation Development Council
- Bankers Trust Company
- Bronx Chamber of Commerce
- Bronx High Schools' Parent Association
- Bustelo Coffee Roasting Company
- Economic Development Council
- Loral Electronics Systems, Inc.
- National Alliance of Businessmen
- New York Chamber of Commerce
- New York State Department of Labor
- Open Doors
- Sears Roebuck and Company
- Secretarial Systems, Inc.
- United Auto Workers of America
- Universal Temporaries
- Xerox Corporation

The original education component included representation from the Center for Career and Occupational Education, Superintendent's Office-Bronx High Schools, and the COER Project Director.

The Commission held three meetings over a three-month period. The first, an orientation meeting, defined the mission of the Advisory Commission as being advisory to the activities of the Project. The following specific functions were established:

- advisory -- selection of occupations for training
- review - existing training programs being offered in the schools
- review - proposals for continued funding.

It was recommended at the first meeting to include representation from all Bronx high schools.

The purpose of the second meeting was to afford the opportunity for an open exchange between business, education, labor and the community. At this meeting, representatives of education expressed an interest in discerning the feelings of business and industry toward improved relations between education and the latter. Business/industry representatives offered these comments:

- Vocational high school graduates frequently lack maturity and special skills.
- Companies required to pay union wages expect full production from their employees.
- Schools and employers need to level with each other; recognize the limits of school training; define entry-level jobs, their requirements and describe upgrading opportunities.

The third Commission meeting concentrated on reviewing proposals and program descriptions for (a) the

Comprehensive Occupational Education System (COES), (b) the Career Development Center (CDC), and (c) the on-the-job training component of the CDC. The Commission members were in agreement on these follow-up activities and/or goals:

- to design and implement a Centralized Information System;
- plans should include incorporation of the Bronx Career Counseling and Resource Center;
- to seek private foundation funding; and
- assistance of the Bronx Chamber of Commerce in seeking business/industry sponsorship.

Although the roles of the advisory bodies was to be strictly that, a pattern of even deeper commitment was manifested. A role of advocacy for and support of the objectives of the Project in the development of a COES developed. (The objectives were also supported by the research findings and by the data from the interest and job market surveys.)

It should not be inferred that all meetings ran smoothly and without differences of opinion, however. There were some meetings at which very real disagreements occurred. Some of these differences focused on, for example, the skill center concept and implementation of a program which would provide tangible results for the Bronx.

* * * * *

The contributions of the Steering Committee and the Bronx Advisory Commission on Vocational Education were so significant that the COER Project decided to recommend the use of an advisory body in educational planning. However, the commission would not be recommended as it existed due to a heavy preponderance of educators among the representatives of various groups. This was probably due to the frequency of the meetings, which interfered with other pressing priorities of the business community. This led the project to conclude that any plan for business involvement should include fewer meetings of this type, but that the results of these meetings should lead to more day-to-day contact with members of the business community at lower levels.

To reiterate, this involvement with business, industry, labor and the community has been varied and beneficial. The initial research of the Project confirmed the value of this cooperative involvement, but also revealed the need to further such coordination and articulation with these segments of the community. It was also felt that duplication should be minimized in the sense that businessmen are asked to participate in an advisory capacity to various educational bodies.

FOOTNOTES/CHAPTER THREE

[1] The Enterprise Experience, run through the Bureau of Industrial Arts, Center for Career and Occupational Education, is an example of the type of exploration to be found at this level. This program involves students in the forming and managing of a "mini-corporation," and provides simulated experiences in areas such as the R&D process, marketing of a product, and management.

[2] A Plan for a Comprehensive Occupational Educational System in New York City, p. 12.

[3] Daisey Shaw, Memo to Counselors, BEVG, June 1976.

[4] Ibid., p. 10.

[5] Ibid., p. 7.

CHAPTER FOUR

THE CAREER DEVELOPMENT CENTER

4.1 PROGRAM DESIGN

The Career Development Center (CDC) would function as the focal point for the activities of the Comprehensive Occupational Education System (COES). It would house the administration, guidance and placement components, the Centralized Information System, and several occupational training programs. Its activities would be further extended through the magnet schools (discussed in greater detail below).

It is one thing to develop attractive options; it is another to make them accessible. In a system such as New York's educational system, accessibility is achieved through judicious placement of offerings at disparate sites, and through tested institutional models such as the dual enrollment programs (which have been successful and would be expanded as part of the COES). In both the CDC and the magnet school programs, student entrance to "off-site" offerings at convenient times would be facilitated through individualized student programming.

The Career Development Center would provide training which is not economically feasible in other settings. The CDC would further serve as the test site for new programs which would later be expanded to other sites within the system.

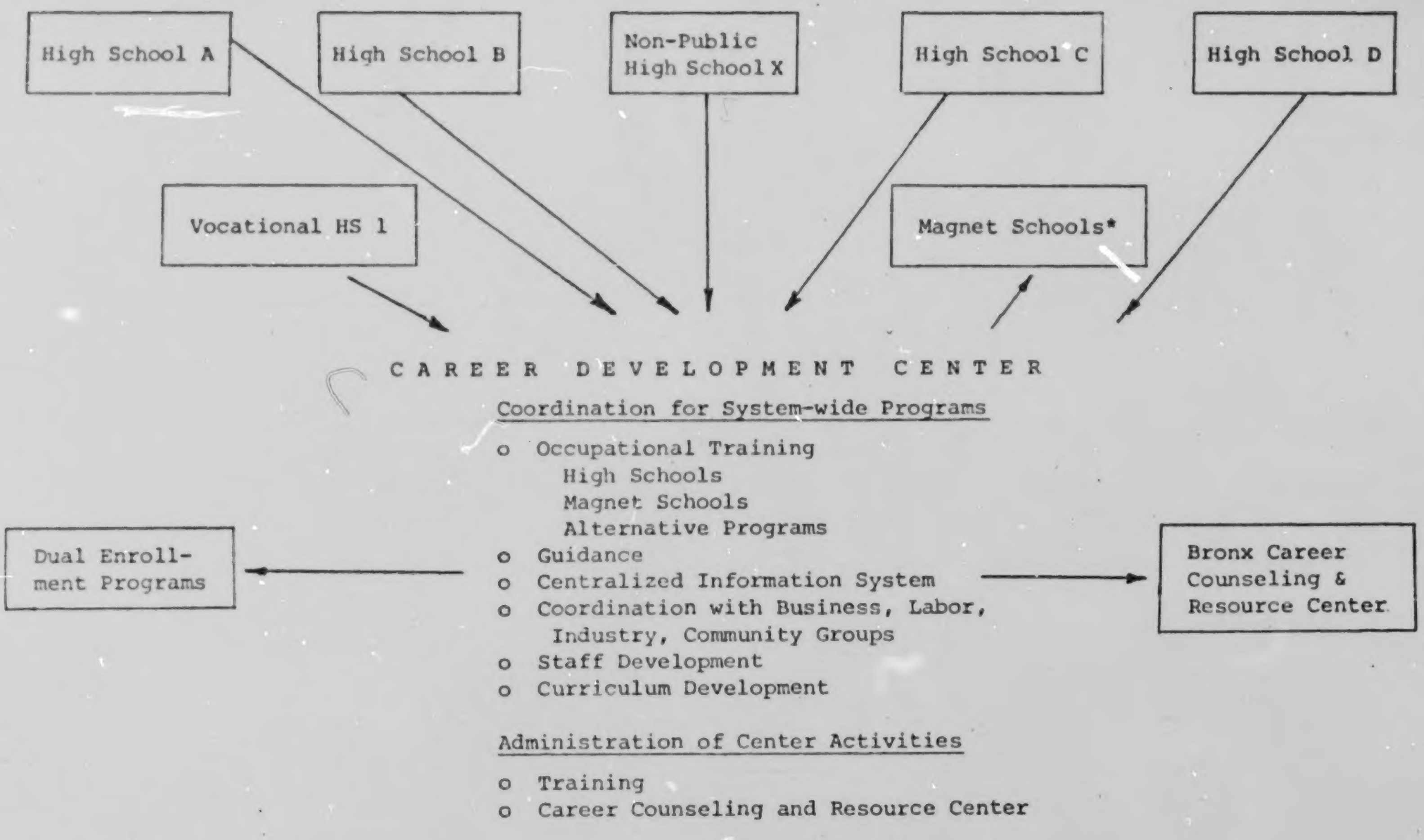
4.1.1 Magnet Schools

The overall COES features a system of magnet schools to complement the program offerings at the CDC. (See Figure 4.1.) The magnet schools would be composed of three academic/comprehensive high schools grouped together based on locality and occupational training facilities. Each of the three schools would offer three different clusters and would share students. This would alleviate the problem of limited options within a school (the options being limited by such things as lack of enrollment within one school). By combining three schools, there would be sufficient enrollment to justify a wide range of course offerings in a particular program area.

From the student's point of view, he/she would have the option of going to any of the three schools for occupational training. This would provide more options than would be available in his home school alone, and would provide a more efficient and economical means of delivery. When the magnet school did not offer the desired occupational training, the student would have several other options. The first would be the Shared Instruction program, by virtue of which he/she would be able to attend one of the vocational high schools. A second alternative would be the After-School Occupational Program. If neither of these accommodated the student's particular needs, the student would still have the option of attending the CDC.

* * * * *

The Career Development Center would serve two major functions: (a) training and (b) coordination. The balance of this chapter will deal with these two functions in the order presented above.


High School A
High School B
Non-Public High School X
High School C
High School D
Vocational HS 1
Magnet Schools*
CAREER DEVELOPMENT CENTER
Coordination for System-wide Programs
o Occupational Training
High Schools
Magnet Schools
Alternative Programs
o Guidance
o Centralized Information System
o Coordination with Business, Labor, Industry, Community Groups
o Staff Development
o Curriculum Development
Administration of Center Activities
o Training
o Career Counseling and Resource Center
Dual Enrollment Programs
Bronx Career Counseling & Resource Center

*Any or all of the Bronx high schools may be magnet schools, depending on their location, facilities, course offerings and capacity.

FIGURE 4.1: PROGRAM DESIGN, CDC AND MAGNET SCHOOL SYSTEM

4.2 OCCUPATIONAL TRAINING PROGRAMS AT THE CDC

The Career Development Center would function as the focal point of all occupational training (as discussed earlier in this report) taking place in vocational schools, academic/comprehensive schools and magnet schools. The CDC would offer training programs to complement and broaden existing options. Types of programs offered would include:

- programs not offered elsewhere in the system, including new programs for which no facilities exist in the home or magnet schools, and core programs for which a demand exists citywide but for which only one facility is required;
- programs already offered in academic/comprehensive and vocational high schools, where there is sufficient demand to warrant program duplication;
- advanced, specialized programs which would not be economically feasible for a high school;
- short-term and highly specialized programs which draw from a broad variety of program offerings; and
- experimental programs to be field-tested and possibly replicated in a high school setting.

Final decisions regarding specific CDC programs must be based on interest, labor market analysis, the universe of need, and further studies. The following is offered as an example of the programmatic content of a CDC.

The Career Development Center could have five cluster areas: Business, Medical Service, Building Construction/Maintenance, Electronics/Electro-Mechanical, and

Power Mechanics. The relationship of these within the CDC is shown in Figure 4.2. Central to each cluster is an employability module at the conclusion of training, the function of which is to prepare students for finding and holding a job.

The Business and Service clusters show some commonalities, but are essentially distinct in their content. The other three clusters are all related in some aspects of core skills and knowledge (illustrated by the overlap of the three cluster areas in Figure 4.2). In other cases, the overlap of skills and knowledge only affects two of the clusters.

Particularly within these three clusters there is a possibility of mobility from one cluster to another due to these commonalities. For example, a student in the automobile mechanics program may develop a special interest in electrical work based on his experience in the auto electrical area. The transition to the electrical program would be a logical route, and the student's prior knowledge of automobile electrical systems would be of value in this new area of study.

The CDC should be capable of offering the following courses, as conditions warrant:

BUSINESS CLUSTER

Bookkeeping
Accounting
Computer Operator
Computer Programmer
Keypunch Operator
Stenographer
Typing
Office Machine Operator
Bilingual Secretary
Medical Secretary
Dental Secretary
Legal Secretary
Zero Defect Secretary

MEDICAL SERVICE CLUSTER (service and support to technical and professional job areas)

- Medical Assistant
- Geriatric Aide
- Child Care Aide
- Lab Assistant
- Veterinary Aide
- and any other areas which may develop due to changes in technology

BUILDING CONSTRUCTION AND MAINTENANCE CLUSTER

- Home Improvement and Maintenance
- Carpentry
- Cabinetmaking
- Plumbing
- Masonry
- Electrical Installation
- Painting & Paperhanging
- Sheetmetal Working

ELECTRONICS/ELECTRO-MECHANICAL CLUSTER

- Radio/TV Repair
- Computer Maintenance & Repair
- Electronics Technician
- Appliance Repair (small & major)
- Air Conditioning & Refrigeration
- Sewing Machine Repair
- Office Machine Repair

POWER MECHANICS CLUSTER

- Automotive Mechanic
- Service Station Operation
- Diesel Engine Mechanic
- Auto Transmission Mechanic
- Auto Engine Mechanic
- Small Engine Mechanic
- Auto Electrical Mechanic
- Auto Ignition Mechanic
- Brake Mechanic
- Tune-Up Mechanic
- Component Parts Rebuilding
- Truck and Bus Mechanic

The training programs to be offered at the CDC should be implemented based on Computer-Managed Instruction (CMI), such as in Philadelphia. The CMI would utilize the CIS, particularly the MIS sub-system, to provide the instructor with data upon which the instructional program could evolve. The following is an illustration of the CMI approach.

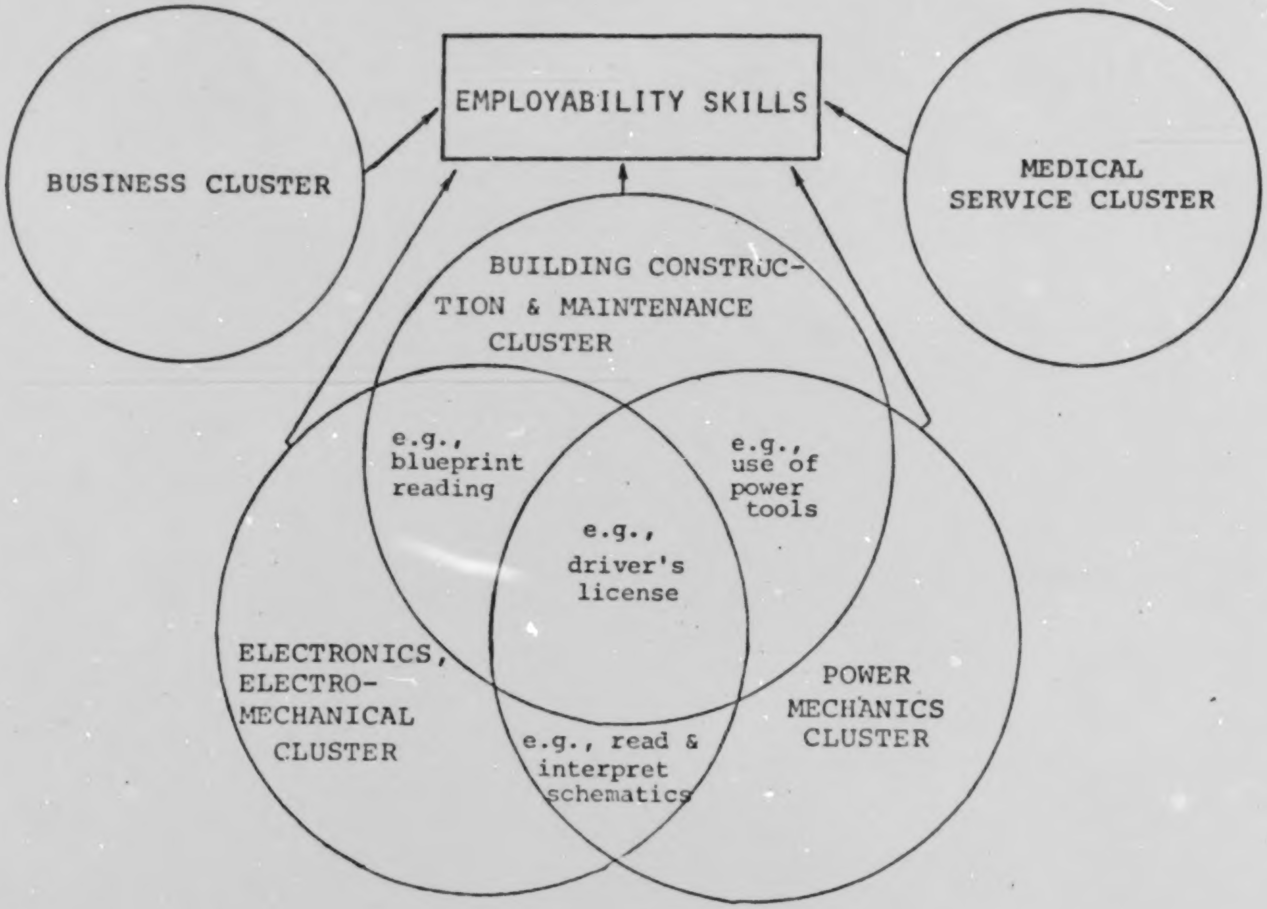

EMPLOYABILITY SKILLS
BUSINESS CLUSTER
MEDICAL SERVICE CLUSTER
BUILDING CONSTRUCTION & MAINTENANCE CLUSTER
e.g., blueprint reading
e.g., use of power tools
e.g., driver's license
ELECTRONICS, ELECTRO-MECHANICAL CLUSTER
POWER MECHANICS CLUSTER
e.g., read & interpret schematics

Figure 4.2: Clusters for a CDC

(NB: overlapping areas indicate skills/knowledge common to the various clusters)

4.2.1 The CMI Approach

First of all, data on each student is stored in a central computer (including special aptitudes, learning patterns, cultural backgrounds, etc.). Each student is then tested for overall learning characteristics and achievement. The computer also stores files or units of instructional materials for each curriculum segment. A complementary set of objectives may then be selected, and recommendations may be made by the computer for a study program (with the instructor receiving a matching set of teaching/learning units). The instructor may modify the selections, subject to certain conditions.

The computer also stores a complete file with lists of guides to instructional materials for each segment of the curriculum. For each instructional module, several guide units are available which differ as to media, learning styles, and vocabulary. All guide units, however, have the same objectives, and evaluation is based on the same terminal test. Teaching/learning units are provided in all subject areas.

After implementation, the computer aids in the evaluation of each student's progress; the instructor is not only told the missed questions, but also the behavioral objectives which were not learned. A recycling of the student takes place with the same materials or another appropriate teaching/learning unit emphasizing the missed objectives.

In fully developed form, the computer system is also involved with correlation and documentation. For example, an instructor with 30 students in home economics -- each studying a total of 100 learning units -- is presented with over 10,000 combinations of students and units. To keep accurate records of each student's set of behavior objectives, would be impossible without a computer to monitor and operate the information system. Therefore an instructor is given more free time to spend with individual learning problems. Perhaps a more valuable, indirect effect of CMI is the result that subject matter and learning characteristics may be correlated. The computerized system can evaluate materials and the conditions under which they are most effective in relation to individual characteristics.

The CMI approach includes the following functions:

Selection of a Comprehensive Set of Educational Objectives. This is necessary in order to fit instructional activities to the needs of each student. For the proposed center, not one set of objectives will be formulated, but rather a comprehensive list of educational objectives.

The list of objectives will be selected by identifying and surveying the programs already in existence (those supported by various foundations, developmental projects at colleges, universities, model programs, work of local school districts in curriculum innovation, etc.). From this extensive list, each student will work with instructors and counselors for the planning/selection of those objectives relating to his educational growth and development.

Planning and Guidance for Each Student. Emphasis will be placed on planning and guidance to ensure that each individual has the assistance he needs to acquire knowledges and skills in specific clusters. In addition, each student will receive assistance in obtaining comprehensive information about himself (his capabilities, interests, etc.).

The remaining part of this function will enhance the development of each student's ability to make effective decisions and selections in a different environment.

Instructional Materials Review/Literature Search. Recent searches have been originated to identify all types of instructional materials, new methods, media, and applications of educational technology. Many materials have been reviewed and developed, including developmental programs, the experience of selected local school districts in curriculum innovation, and the work of publishers and organizations representing the new educational technology industry.

These searches have identified many kinds of instructional materials, methods, and technology as applied to career education programs. The review of these materials has included the study of the evaluative data available.

The second product of the literature search is specification of the "extent of the problem" relative to each student. This knowledge would be catalogued in the computer to describe:

- learner characteristics (sex, age, race, I.Q., physiological factors, etc.)
- skills, variations in skills, etc.
- learner behavior(s)
- learner's environment (socio-economic level, geographic areas, language spoken in home, etc.)

Recommendations may also be made to fill any gaps in available information.

Evaluation "Checklist" for Daily Progress. The fourth function of CMI is to provide a checklist for each person's daily progress in his learning modules. This monitoring must take the form of stating precise behavioral objectives and testing to see if the objectives were met. Achievement for each student must be analyzed in terms of performance standards and established criteria for each instructional unit. It is, therefore, extremely important that everything be recorded (knowledge, special talents, abilities, behavior patterns), in order to provide assistance in the development of future roles.

4.3 THE CDC GUIDANCE PROGRAM

4.3.1 Introduction

The CDC concept represents an occupational education delivery system which is intended to reach a variety of populations not currently being serviced through traditional settings. These populations include in-school youth, out-of-school youth, the handicapped, and adults. Its approaches and modes of operation should reflect the special needs and circumstances of these varied populations.

The original narrative of the COER Project speaks of counselors joining "with teachers, administrators, representatives of business and industry, and community members in school and non-school settings to work collectively to plan programs of guidance."[1] This implies expanding the role of the counselor beyond the confines of the guidance cubicle, out into the school and the community. According to this approach, the counselor will no longer be seen as a one-on-one practitioner, but rather as one dealing with the wider concerns of his client's environment.

Agenda for Action[2] addresses the concept of the counselor as a "change agent":

> Basic to the notion of the counselor as change agent is the theory that human learning and development is as much influenced by extrinsic, environmental factors as by intrinsic, individual factors. Intervention limited to the life space of an individual may be insufficient to help him,

> since it may do little to affect the forces supportive of his particular behavior. By intervention in such areas as the power and influence structure within schools, the family social system, or the opportunity structure outside the school, the counselor may help create conditions more facilitating to an individual's potential and eliminate conditions working against the healthy growth of the individual. Assistance to and opportunities for meaningful involvement need to be vigorously advanced.

4.3.2 Organization

The Career Development Center is a key component of the Comprehensive Occupational Education System. This cornerstone concept is emphasized by plans which have both the CDC and COES functioning out of the same physical plant. This joint tenantship would lead to a cross-fertilization of energies, as well as greater usage of COES resources by the CDC. Therefore, the guidance structure of the CDC would be geared to making use of COES guidance resources. It would also be geared to servicing the individual students at the CDC.

Components of the guidance structure at the CDC would include the following major elements:

- a Career Information Center;
- a career planning and counseling program;
- a job placement and follow-up program; and
- a community outreach program.

4.3.2.1 Career Information Center

The Career Information Center would be a central feature of this guidance program and would serve as a hub from which other services would flow. A student coming to the Career Information Center would be able to obtain:

- an appraisal of his abilities, interests and aptitudes
- occupational and educational information
- individual counseling.

The Career Information Center would constitute a unit in the COES Career Guidance Information System and would be a recipient of that system's information flow. The Center would assist in career decision making and feature work readiness procedures (including role playing, interviewing, job simulations, and utilization of role models through bringing community people and resources into the Center).

The Career Information Center's linkage with the Career Guidance Information System would enable it to utilize its updated material on occupational training, thus giving students greater flexibility in choices relative to training. It would also afford counselors access to human resources to provide information for referral of youngsters with special needs.

A design developed by Frank Burnett, for implementing a career information center, is a valuable reference source in this area.[3] The design is a product of the National Career Information Center of the American Personnel and Guidance Association, and is both a theoretical framework and a practical step-by-step outline of how to organize a Career Information Center. The outline covers the following areas: size and location of space, equipment and furnishings, types of materials, program and services, staffing patterns, hours and operational procedures, communication with different populations, evaluation procedures, and budget.

The approaches discussed above serve to make a Career Information Center into a vital part of any comprehensive system of occupational education. Emphasis is placed on the utilization of people, rather than total reliance on written materials and documents.

The community is involved as an integral part of a Career Information Center. (See Section 4.4.) Participants would be able to call upon particular individuals who could give career information relative to a specific trade or business. These career consultants would include senior citizens, local businessmen, union members, students with expertise in specific areas, graduates who have entered varied fields, and other available resource persons.

The community would also be involved in that out-of-school youth and adults would be serviced. Toward this end, Mr. Burnett suggested a flexible approach of non-traditional hours, which would include before/after school, week-ends, and evenings.

4.3.2.2 Career Planning and Counseling

The counseling component of the CDC should be centered around the development of a career plan for each trainee. The planning would start as part of the intake procedure and would be an ongoing process, providing an awareness of the career possibilities for the future.

Career planning would continue through the job placement process and/or advanced training programs. This would be accomplished through both individual and group counseling situations which deal with problems of class placement, program retention, job placement and follow-up. Career planning would utilize appropriate interest inventories, career exploration materials and occupational training information.

4.3.2.3 Job Placement and Follow-up

A CDC job placement service is an important function of the program. This service would involve a most difficult task in the face of continued high unemployment rates among young people, particularly minority youth. But occupational training cannot be halted due to current unemployment rates. Job placement must emphasize the cluster approach, where skills can be used in a variety of areas, in order to endow adaptability in a changing and fluid labor market.

The job placement function would be integrated into both career planning and the Career Information System. Specific activities would include:

- developing a file of employers and possible job openings through local research, trade contacts of vocational teachers, and the resources of the CDC Advisory Committee;
- utilizing public and private employment agencies and personnel offices of appropriate industries;

- utilizing public information sources and the media for job information;
- maintaining contacts with unions, professional groups and government agencies; and
- exploring an individual trainee's resources and personal contacts.

4.3.2.4 Community Outreach

Community outreach refers to an approach which views the counselor as being involved in the larger community surrounding the CDC. This entails interaction which should make community resources available for the benefit of the CDC and for community utilization of the CDC. This would provide the CDC with a sense of being an integral part of the community in which it operates, and can lead to a better exchange of resources and strengths.

Following the community outreach approach, the CDC guidance service would:

- develop expertise in such environmental community concerns as housing, welfare, health facilities, jobs, etc.;
- participate in organized community activities such as community planning boards, health advisory boards, and other groups dealing with environmental concerns;
- make available the resources of the CDC for community usage; (This would include such facilities as the Career Information Center and the Career Information System.)
- involve the community in developing guidance goals and objectives as part of the community based guidance model; (This would include a local needs assessment, planning and structuring based on assessment, implementation and evaluation and feedback.)

4.4 CDC COORDINATION WITH THE COMMUNITY

A model plan to increase the involvement of business/industry/labor and the community was presented in Chapter Three of this report. Increased coordination and cooperation with these sectors should help to achieve greater opportunities for on-the-job training, in-service training, cooperative work experiences, and the availability of various other services/resources to school personnel, students and parents. With this framework as a guide, specific articulation activities and procedures to be conducted in a Career Development Center will constitute the subject of this section.

The CDC would maintain a working relationship with any group capable of furthering the goals established for the CDC and the COES. Those groups presently involved in coordination efforts include the following.

The Center for Career and Occupational Education

The CCOE, through its Community and Business Relations Office, encourages a business/industry/school partnership. Some of the joint activities emanating from this partnership are:

- establishment and maintenance of a line of communication between CCOE and all career education programs in the City of New York;
- directing the involvement of business in the implementation of career education programs and activities;
- preparation and dissemination of career education information to local news media;
- planning of career education conferences; and

- maintaining contacts between directors of career education programs and local community, business, union, industry, and public service leaders to identify and solve common problems through cooperative efforts.

The Advisory Council for Occupational Education

The New York City Board of Education has a major link with business, industry and labor through the Advisory Council for Occupational Education and its forty-plus commissions. The Executive Secretary of the Council, as a member of the Bronx Advisory Commission, would help strengthen the coordination between the COES/CDC and the business community.

City-Wide Integration of the Handicapped in Vocational Training

This program is designed to develop and implement a wide range of mainstream vocational experiences for handicapped students. The program maintains a continuing liaison with community agencies serving the handicapped, labor and industry, and other educational institutions. Work/study and on-the-job training programs are offered in a variety of industrial areas.

Bureau of Educational and Vocational Guidance

The BEVG sponsors programs involving the business community. In cooperation with the National Alliance of Businessmen, the Division of Special Education & Pupil Personnel Services sponsored, through the BEVG, a number of career guidance institutes. Typical of these was the summer 1976 institute, designed to provide junior and senior high school counselors and teachers with in-depth exposure to the business community through first-hand experience on actual job sites.

New York State Employment Service

The New York State Employment Service assigns personnel to high schools to help find part-time jobs as well as entry-level jobs for high school graduates.

Economic/Aviation/Regional Councils

The COES, and therefore indirectly the CDC, would maintain a relationship with the Economic Development Council, the Aviation Development Council, and the New York Regional Council for Industry-Education Cooperation. Such a viable partnership should contribute to increased involvement of metropolitan New York businessmen and community groups.

4.4.1 The CDC Director

The Director of the CDC would have the major responsibility of directing the liaison with business/industry/labor and community groups. Coordinators would assist the Director in these efforts to increase linkages with the community. The Bronx Advisory Commission on Occupational Education would provide the liaison to close the gaps which presently exist in the coordination structure.

As a member of councils/agencies/alliances and other groups, the Director would extend the resources usually associated with such membership. The Director would bring questions and problems to the attention of the Executive Secretary, who would serve as the intermediary between the Bronx Advisory Commission and the City Commission for occupational education. Thus occupational education planning efforts in the Bronx would be coordinated and duplication of efforts between education and business would be reduced. Under this plan the coordinators would have responsibility for maintaining day-to-day contact with cooperating agencies.

In summary, the CDC Director and staff, with the advice of the Advisory Commission and under the direction of the administration of the COES, would have the potential to increase the involvement of more and more businesses and to advance occupational education throughout the system.

4.5 CDC FACILITIES

The major problem facing manpower planners is that of projecting demand for individual occupations over a long period of time. This is even more difficult for educational planners, who must have the physical capability to train people to meet this demand. Coupled with this are the problems of obsolescence and technological change. These combine with time factors (the time between when the idea for a program is first conceived and when it is operational) to prevent our taking advantage of many opportunities. But even though it is difficult to project demand for individual occupations, it is possible for broad classes of occupations.

Since most occupations call for the application of skills and knowledge drawn from a variety of disciplines, the design criteria for the CDC involve "capability requirements" rather than program requirements. Every effort would be made to plan capabilities that are weighted in accordance with the overall occupational demand picture represented by available manpower projections.

This approach to facility planning means that the CDC would have a significantly higher level of program flexibility than conventional schools. It also means that the CDC would have the capacity to respond easily and swiftly to changing manpower demands and/or to the needs of individual students. A detailed discussion of this concept, as it applies to the planning of a physical plant, is presented in the following pages.

It is important to realize that the CDC would be but one component of New York City's total occupational education delivery capability. Therefore shop facilities and other instructional support spaces planned for the CDC would not be designed to offer all components of an instructional program. Nor can it be assumed that all programs would be organized in the same manner. Each program would relate differently to other components of the total system. Thus while some facilities would be planned to offer complete instructional capabilities (including exploratory and advanced instruction), others would only provide for specialized advanced courses, and some would provide only middle-level instruction, with advanced instruction available in on-the-job settings.

The following pages present the philosophy and rationale underlying the planning of such a facility. This discussion is offered so that the reader may be fully advised as to the process by which our model CDC was developed.

4.5.1 Planning a Facility

This section deals with the process for determining the nature of a physical facility to house a Career Development Center, along with quarters for the Comprehensive Occupational Education System. The COER Project was faced with a number of questions in this regard:

- What kind of structure would be needed?
- How big should it be?
- How should it be laid out?

- Should a new building be constructed, or could an existing installation be used?
- Where should it ideally be located? and;
- How does a school district proceed in answering such questions?

Solutions to facilities questions must begin with the basic purpose or objective of the building, that is, the form of the facility must evolve from the objectives it is designed to achieve. The planning process must be an orderly progression from goals to final form, and the form must clearly grow out of the goals.

Certain general objectives have already been established in this study: rapid adjustment to the needs of the labor market, shorter training periods, open entry/exit, the potential for rapid adaptation in training techniques, and career development for all who desire it. In pursuing these objectives, it has been assumed that the Career Development Center would be a separate organization, attended on a part-time basis by those students who opt for it as part of their regular high school curriculum. Credits and graduation would come through the home high school.

Training courses in several different occupations would be offered at the Career Center, in such a way as to take advantage of economies of space, administration and overhead. In this model, clusters of courses are recommended in the areas of Medical Assisting, Power Mechanics, Electronic/Electrical Appliance Repairs, Building Construction/Maintenance, and Business Secretarial functions. However, a basic premise of the Center's organization is that particular courses within a cluster, or whole clusters, may be changed rapidly as a result of shifts in the local occupational market.

The following objectives and patterns of organization broadly determine various characteristics of the Career Center:

- It must be located such that it is accessible to the regular high schools whose students it will serve.
- It must be architecturally accessible to the handicapped.
- The layout of shops and allied facilities must be readily adaptable to physical change in order to facilitate training shifts from one occupation to another in response to evolving labor market requirements.
- The Center would not require complexes of academic classrooms or large-space auditoria, cafeterias, or gymnasia of the full-time regular high school.
- The various occupational courses at the Center should share facilities as much as possible.
- The Center should provide opportunities for mainstreaming of handicapped students, as well as parallel training for those students who require small class settings.

Thus far broad goals and a general organizational pattern have been established. However, in order to lay a basis for developing facilities specifications, it is necessary to identify more specific objectives and patterns of organization. Generalizations are not enough, and may even be confusing to the facilities' designer.

First of all, certain items relative to scope must be established. These include quantitative decisions on the following:

- the number of different occupations for which training will be offered;
- the specific occupations which will be included when the Center initially opens;
- the number and length of sessions per day; and
- the number of students to be enrolled per occupation and per session.

After establishing a quantitative framework, the next step is determination of the kinds of spaces needed. As previously noted, space specifications should be a function of training goals. In order to derive the specifications, it is necessary to first set down the goals. Such a statement should be followed by a model set of normative behaviors and activities which would lead to attainment of the desired goals. From this model there should follow a list of physical conditions, relationships, and constraints which may be expected to optimize the anticipated behaviors and thus facilitate the achievement of the goals. (A model of related goals, behaviors and facilities requirements for a specific occupational training course is included in ATTACHMENT I.

The general goal of effective, quick, and relevant occupational training is not sufficient for the synthesis of facilities specifications. To be useful in the process of deriving space requirements, the goals must be broken down for each particular occupation in specific terms. Given these guidelines, it is possible to derive the requisite behavioral activities.

For example, a general goal for a course in Medical Assisting, such as to "prepare the student to perform efficiently as an assistant in a medical office," would contribute little as far as space design is concerned. The architect would know that he was expected to produce a medical layout of some kind, but would receive no direction beyond that. By decomposing the goals into subsets, such as "efficient conduct of examination procedures," we open the way for specifying behavioral activities which should be of real value in promoting the attainment of the objective.

The activities would include: practice in setting up for complete physical examinations; performance of aseptic procedures preliminary to examinations; measuring height and weight; etc.

Facilities requirements can now be derived from the expected activities. It follows that if a student is to practice setting up for a physical examination, there will have to be a patient examining room in which to practice. And to perform the incidental procedures, this room should be equipped with an examining table, dressing alcove, sink, sterilizer, scales, supply cabinet, etc.

By way of example, 83 separate requirements were derived for the Medical Assisting course, many of which were repeated with regard to different objectives and different activities, and all have interacting relations with each other. (Computer programs exist to sort these out into subsets and then group them into form relationships.) However, pertinent and adequate space designing can be achieved through the conceptual process which follows.

The items in the behavior activities column of the "Requirements Derivation Chart" can be synthesized into groups on the basis of learning method affinity. For example, in the model for Medical Assisting (see Attachments), all those conceptualization activities which are performed in groups (e.g., discussion, lecture, games, film presentations) are subsumed under "group learning"; those which involve independent activity are placed under "individual inquiry"; and the various patient-related medical procedures, medical business routines, and laboratory functions are grouped under their respective "practical experience" headings. An inspection of these activity groupings leads to the conclusion that five general types of space will be needed:

- group areas: classrooms, lecture halls, video rooms
- inquiry areas: medical centers and small conference rooms
- medical areas: waiting, consultation, examination, x-ray, therapy, testing, sterilizing, drug storage and reception rooms
- business area: secretarial and financial offices
- laboratory areas: analysis and research areas.

Having established the types of spaces that will be needed in the Career Development Center, it is now necessary to become specific as to the size, number, and requirements of the various spaces. The number and size of spaces will depend upon the number of students per class and the number of periods allocated for each learning method. It may be assumed that a class group will approximate 25 students (inasmuch as 25:1 is the model student/teacher ratio in the United States). Then it will be necessary to make curricular decisions as to the number of weekly periods each class should be assigned to each learning method, e.g., class discussion, independent study, etc. Having determined the total enrollment in a course, the number of sessions in a day, the size of a typical class, and the time distribution for classes in various learning milieus, it is possible to determine the number for each general type of space needed.

Each learning method is comprised of a variety of techniques requiring specialized kinds of space. Practical experience in medical procedures, for instance, involves therapy, X-ray, examining, sterilizing, care of drugs, and patient interaction. The facilities requirements for learning each procedure have been derived from the set of expected behavioral activities. However, in order to fix data for architectural design, it is necessary to set the dimensions for each subspace. Guidelines for this process are to be taken from actual medical practices, advice from instructors, and from an estimated numerical breakdown of a class to the specific component spaces.

The space decision process can be illustrated by examining two of the learning method groupings to be used in the Medical Assisting course. The curriculum calls for each class of 25 to spend two periods per week in group discussion, one lecture period, one role-playing period, and one audio-visual period. It is assumed that there are to be two daily sessions of five periods each at the Career Center, and further that there will be 125 students enrolled in each session of Medical Assisting. It is further assumed that group discussion and role-playing can be conducted in a typical classroom. If there are five classes in the Center each morning, and if each class were to use a classroom three periods per week, that room would be occupied 15 of the 25 periods per week in a session. Thus one classroom will more than suffice. It is apparent also that a lecture hall and a video facility are needed. But since each of these is only needed for five periods a week (for Medical Assisting), one must look to other occupational groups to use them also. (It was subsequently found that the lecture hall would be an economically unfeasible installation.)

According to the curriculum, each medical class of 25 students would be offered one period of practical experience in medical procedures each day. Since there are nine identifiable areas of procedures, in each of which each student is entitled to practice, the problem becomes one of scheduling. It would certainly be uneconomical to provide an X-ray room large enough to accommodate 25 students at a time (the same holding true for eight other similarly inflated spaces, which would stand idle while the students were in the X-ray room). So one must assume the assignment of two or three students each to spaces of realistic proportions, where they would practice their medical chores simultaneously under the general supervision of the teacher. (Viable sizes for the various Medical Assisting spaces are indicated on a space-needs list to be found in the Attachments.)

The organization of the Center is based on the premise of multiple occupational offerings at one location (five clusters in the case of the Bronx model). A similar requirements derivation process must therefore be completed for each of the other occupational clusters. Then the behavioral activities and the physical requirements must be synthesized into groups, as in the Medical Assisting example, in order to determine what spaces are needed. A similar space-needs list should be prepared for each occupational cluster.

After the synthesis is accomplished for all clusters, the space requirements must be compared in order to determine possibilities for joint use by related clusters. For example, a video room might be utilized by each cluster, but only for a fraction of the time by each. Thus one such installation would suffice for the entire CDC.

Having determined a distribution of spaces by type and quantity, the next step is to check the viability of the specifications by constructing a model schedule. Will there be sufficient spaces of each variety to house all students for each type of learning, without conflict in the use of rooms? On the other hand, will all the spaces provided be used almost all the time, or will there be investment in unused space? Only a trial schedule, based on curriculum and registers, will answer these questions. If there are several allied occupations to be included within a single center, schedules for these should take account of joint-use of certain spaces. (Schedules for power mechanics, appliance repair, and house maintenance courses in a single center, to be found in the Attachments, illustrate interlocking use of a common power tool shop.)

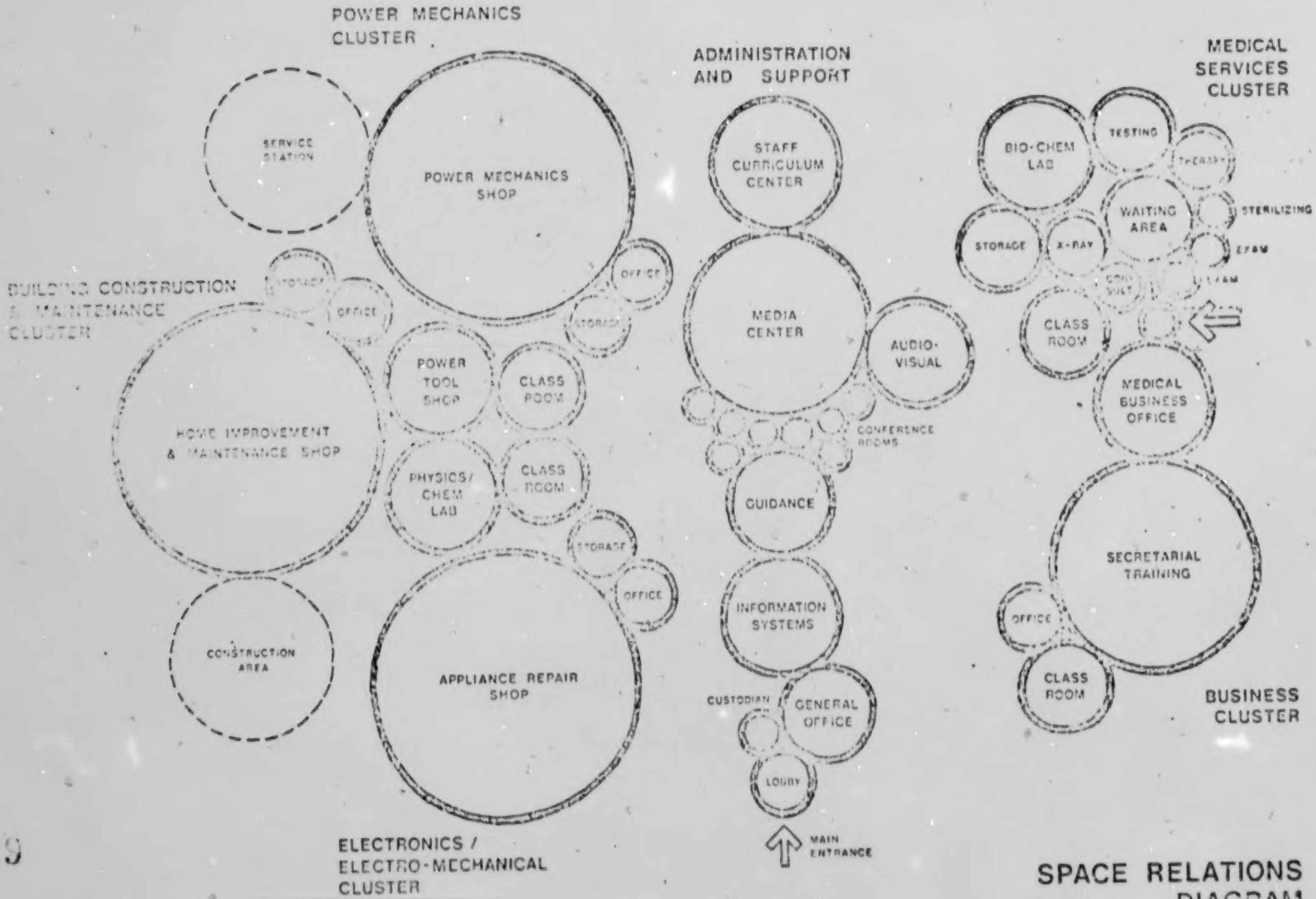
Furthermore, certain constraints, such as required double or triple consecutive periods, student load limitations in a particular area, and daily limits on learning method types for any one class, must be taken into consideration in developing schedules. These constraints may produce assignment conflicts and may operate to prevent maximal use of all spaces (with the result that more square footage may have to be added). On the other hand, a trial schedule may reveal that a space which was called for in the process of requirements derivation cannot be used economically. For instance, in developing the model for the five-occupation center which appears in the Attachments, it was found that there could not be adequate use of a lecture hall, inasmuch as the schedule allocated only one class in an occupation per period to that learning modality. If the lecture were to be given to one class at a time, an available 700 square foot classroom could be used, and a 2000 square foot lecture hall, with its auxiliary facilities, could be eliminated from the plans. Thus we can see that a trial class assignment schedule is essential to the planning process.

As described in this report, the Career Development Center (CDC) is the occupational training focus of the Comprehensive Occupational Education System (COES) which encompasses occupational information, curriculum development, staff training, guidance, and coordination with the community. Each of these support functions also requires a physical base in which to house its staff and its particular equipment and communications media. In building these support spaces into the first COES/CDC facility, it would be prudent to envisage additional career development centers in the future, and with this in mind to plan office space of somewhat greater footage than immediately needed to allow for administrative expansion. The space stipulated in the specifications to be found in the Attachments reflect such foresight. The specified administrative complex also includes a media center and an audio-visual (or video) room, to be used by students and staff from all courses and clusters. In addition, there are spaces specific to the building, including a general office, a custodial office, lavatories, circulation space, and space for mechanical systems.

All space types, including instructional and administrative, can now be specified in outline form on a combined list, which will be used as a guide for the architect. Appendix E includes a space summary for the proposed CDC in the Bronx.

The next task is to translate requirements from verbal form into design terms. A convenient vehicle for so doing is the space relationship diagram (Figure 4.3). The circles are positioned so as to show interrelationships among occupational areas, as well as between occupational areas and the various support areas (such as the media center and administrative offices). Areas for joint use by various occupations are indicated in medial positions.

The overall process described has thus established definitive needs as well as relationships among requirements. As a result, maximal space efficiency should have been established. From the space relations diagram we now develop a schematic layout.


POWER MECHANICS CLUSTER
SERVICE STATION
POWER MECHANICS SHOP
OFFICE
STORAGE
STORAGE
OFFICE
BUILDING CONSTRUCTION & MAINTENANCE CLUSTER
HOME IMPROVEMENT & MAINTENANCE SHOP
POWER TOOL SHOP
CLASS ROOM
PHYSICS/ CHEM LAB
CLASS ROOM
STORAGE
OFFICE
CONSTRUCTION AREA
APPLIANCE REPAIR SHOP
ELECTRONICS / ELECTRO-MECHANICAL CLUSTER
ADMINISTRATION AND SUPPORT
STAFF CURRICULUM CENTER
MEDIA CENTER
AUDIO-VISUAL
CONFERENCE ROOMS
GUIDANCE
INFORMATION SYSTEMS
CUSTODIAN
GENERAL OFFICE
LOBBY
MAIN ENTRANCE
MEDICAL SERVICES CLUSTER
BIO-CHEM LAB
TESTING
THERAPY
STERILIZING
WAITING AREA
STORAGE
X-RAY
EXAM
CONSULT
EXAM
CLASS ROOM
MEDICAL BUSINESS OFFICE
SECRETARIAL TRAINING
OFFICE
CLASS ROOM
BUSINESS CLUSTER

SPACE RELATIONS DIAGRAM

CDES/CDC

Figure 4.3

The sample layout (Figure 4.4) has been designed to accordance with the functional roles of the COES components. At the core of the building are the Centralized Information System, the guidance office, and the staff training and curriculum area, which together serve as the infrastructure for the occupational education system. They are located for the convenience of those entering from outside the building, as well as those coming from instructional areas within the Career Center. The media center and the related audio-visual room (which are resources for staff research as well as student independent study) fill key roles in the COES; consequently, they are located at the heart of the facility.

Located on one side and adjoining each other are the facilities for training in mechanical and building-related occupations. In the middle of this complex, and accessible to all three clusters, are the classrooms, the laboratory, and the power tool shop, which are shared on a scheduled basis. Close by are the media center and conference rooms for independent study, as well as the audio-visual area for individual and group recording, listening and viewing. The curriculum center, the guidance office, and the information bank are also within easy reach for advice and consultation. The medical and business clusters occupy space on the other side of the core, with similar accessibility to the support areas. Their respective classrooms and office type spaces are in sufficient proximity to be borrowed for use when extra space is needed.

All the clusters have been laid out on an "open space" plan, so that they can be easily converted for training in other occupations when the need arises. The

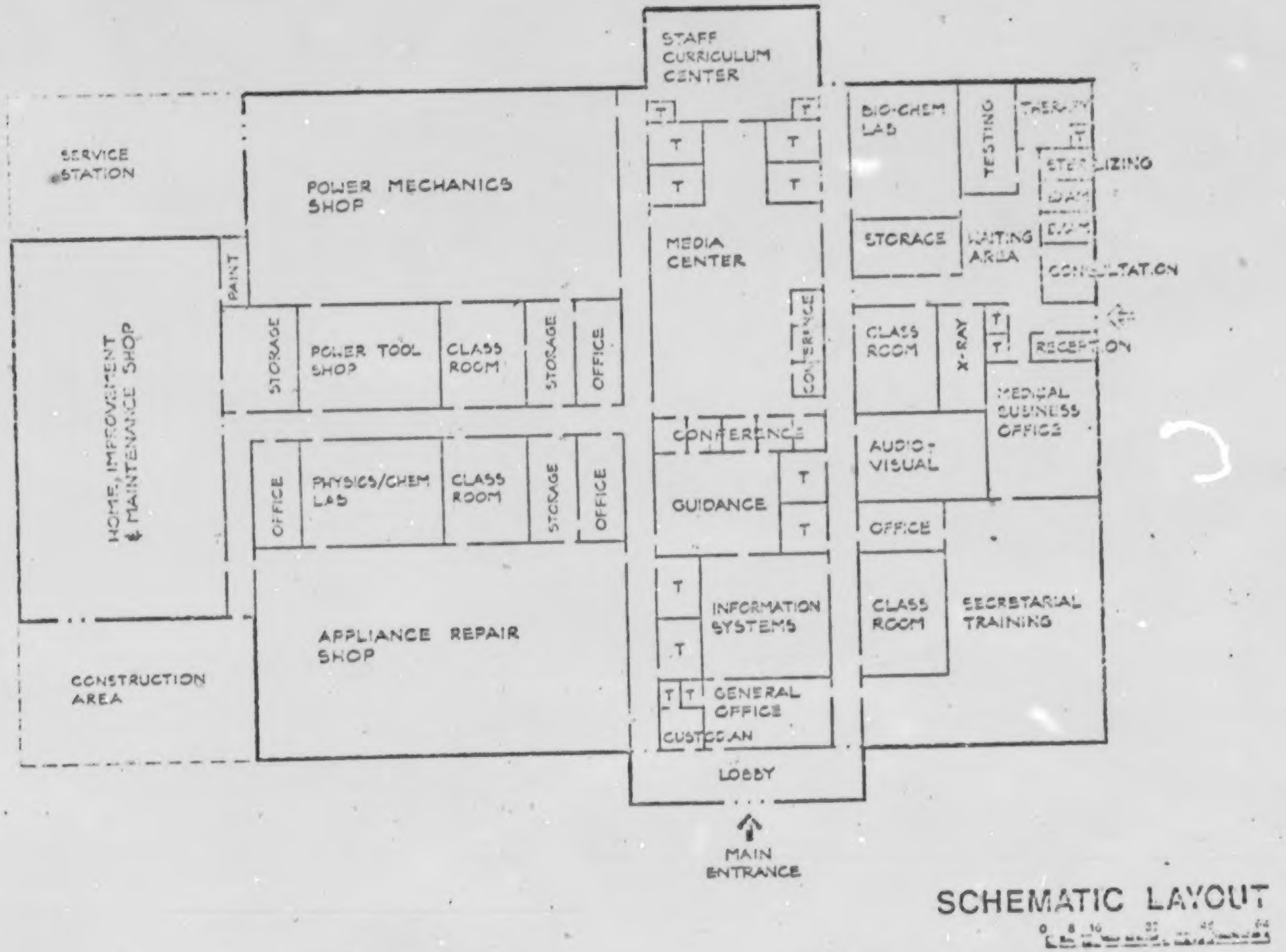

STAFF CURRICULUM CENTER
SERVICE STATION
POWER MECHANICS SHOP
PAINT
HOME, IMPROVEMENT & MAINTENANCE SHOP
STORAGE
POWER TOOL SHOP
CLASS ROOM
STORAGE
OFFICE
OFFICE
PHYSICS/CHEM LAB
CLASS ROOM
STORAGE
OFFICE
APPLIANCE REPAIR SHOP
CONSTRUCTION AREA
T
MEDIA CENTER
CONFERENCE
CONFERENCE
GUIDANCE
INFORMATION SYSTEMS
GENERAL OFFICE
CUSTODIAN
LOBBY
MAIN ENTRANCE
BIO-CHEM LAB
TESTING
THERAPY
STERILIZING
EXAM
EXAM
STORAGE
WAITING AREA
CONSULTATION
CLASS ROOM
X-RAY
RECEPTION
MEDICAL BUSINESS OFFICE
AUDIO-VISUAL
OFFICE
CLASS ROOM
SECRETARIAL TRAINING
SCHEMATIC LAYOUT
0 8 16 32 48 64
COES/CDC

Figure 4.4

allotted space in each cluster will permit a shift in training to almost any other type of occupation (merely by removing existing equipment and furniture and replacing same with the paraphernalia appropriate to the new occupation). Utility connections are planned such that new equipment need merely be plugged into existing lines. Where space must be partitioned off for simulation of reality, as in Medical Assisting, the open plan is still used for the structure, with interior dividers composed of component panels which effectively reduce sound, and are at the same time capable of easy relocation to create other configurations.

At this point in the design process, the specific facilities listed in the last column of the requirements derivation chart can be introduced to flesh out the design plans. All these data should be outlined in a formal statement of "educational specifications," which should include the summary of spaces and their sizes, together with notes on special facilities, relationships, and constraints for each space. The educational specifications will constitute directives to the architect and contractor. At this point the potential users have a basis for evaluating their prospective facility.

Obviously, a new building is most desirable for a center which will satisfy all the requirements developed. However, a new building is also the most costly option. Construction costs have been mounting -- to a high of $65 per square foot in New York City in 1977. Furthermore, many locations will involve site problems. (E.g., no cleared space at a location accessible to students coming from a number of high schools. If a site is identified from which buildings must be cleared, legal delays in the form of eviction proceedings may negate its usefulness.)

Due to such cost and site problems, it would be wise to consider housing the Center in an existing structure which could be converted to meet the proposed educational specifications. Existing buildings are already in place, requiring no demolition (and usually no relocation of tenants). Furthermore, conversion costs range from 20% to 40% of the costs of a new building, depending upon the age of the structure, distribution of rooms, and possibilities for adjusting requirements.

Among possible alternative existing buildings eligible for conversion are:

- a high school in which the enrollment has declined to a level making its further use uneconomical;
- a primary school with low register;
- a factory, office building, warehouse, or bowling alley;
- a portion of an existing operational high school which could be set off from the rest of the building for independent use.

Criteria must be established for choice of a building to be converted; for example:

- location accessible to potential users;
- adequate space to house the program (about 60,000 square feet in the model for this study);
- structural soundness;
- limited alterations such that costs will remain well below those of new construction. (Care must be taken to select buildings which are

not so old that wholesale revisions must be made to adapt to "new codes.")

- adaptability for future physical changes incident to shifts in the occupational courses offered.

The proposed locations of the various major instruction areas and support areas should be indicated on the plans for each proposed alternative. The educational specifications developed for the new building should be adapted for each of the conversions. Obviously, not every desired space can be included at the same size and with the same interspace relationships. Buildings with insufficient space, or those in which the space relationships are unsatisfactory, should be rejected. Schematic layouts indicating physical changes should be prepared for potentially usable buildings, and cost estimates prepared. (See Appendix E for examples of conversion specifications and layouts in New York City.)

In making a final decision as to the preferred means of housing the center, it will be useful to prepare a matrix of criteria for evaluating the alternatives. This should compare capital and operating costs, capacity, elapsed time until occupancy, and goal effectiveness of the buildings under consideration. The matrix form vastly facilitates the process of choice by the administrators and board members. A sample matrix is presented in the Attachments.

4.6 CDC LOCATION, TRANSPORTATION PATTERNS, SCHEDULING AND COORDINATION OF STUDENTS

4.6.1 Location/Transportation Patterns

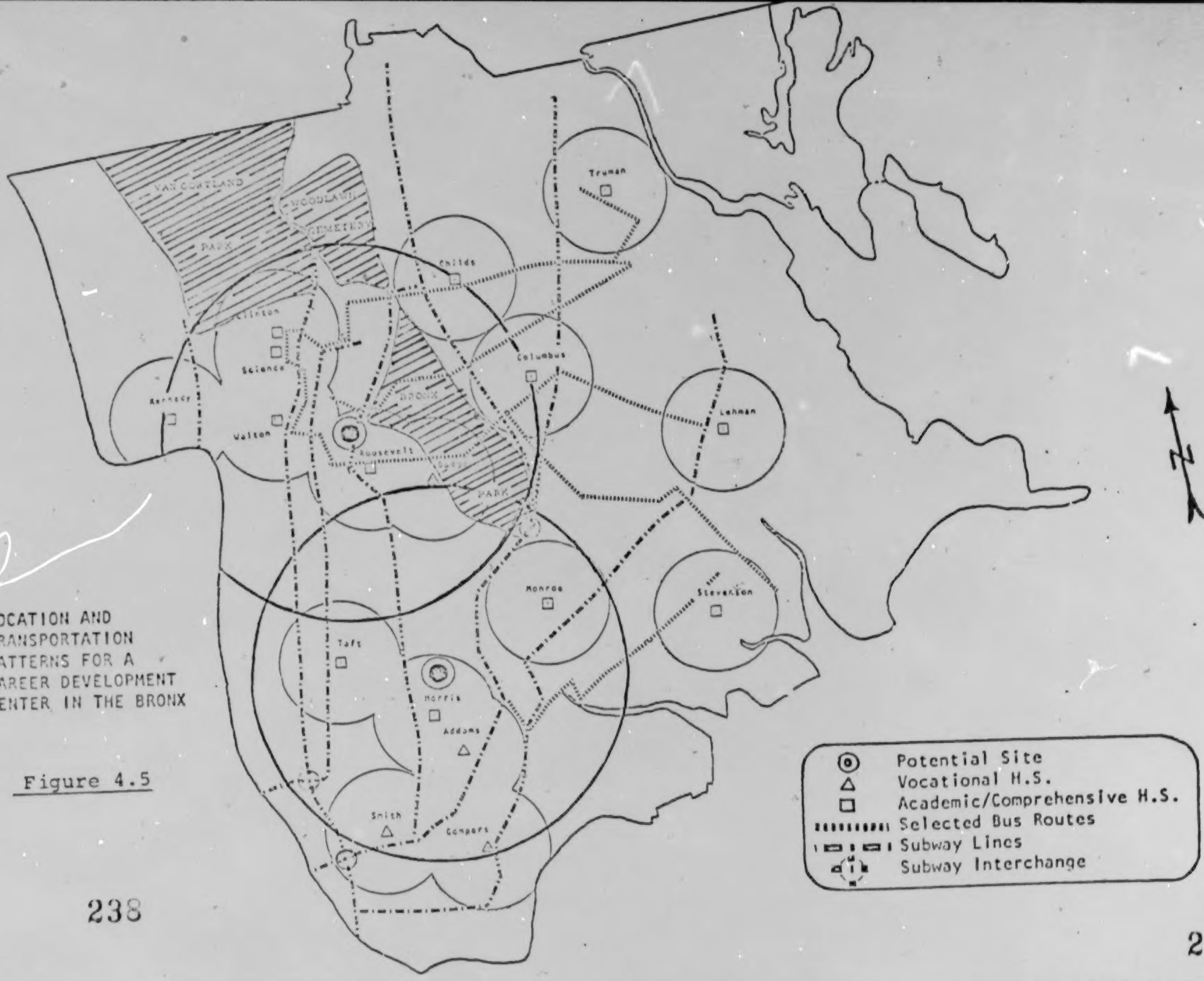
In developing recommendations relative to a site (or sites) for a Career Development Center in the Bronx, several factors were considered. These included:

- access to public transportation;
- proximity to feeder schools;
- potential availability of training and/or employment for trainees; and
- accessibility for out-of-school youth and adult populations in need of training and supportive services.

Two potential location sites in the Bronx have been identified, as shown in Figure 4.5). Both sites are located in the western Bronx, where twelve of the seventeen high schools are located. Site #1 is situated in the mid-Bronx near Fordham Road, a major commercial and shopping district. Site #2 is in the South Bronx, within range of three of the four vocational high schools and three of the academic and comprehensive high schools.

Each site is also located so as to be accessible to the out-of-school youth and adult populations in need of training and supportive services. The major portion of these populations are concentrated in the southwest Bronx.

The sites are situated such that they are easily accessible to a major portion of the high schools within


VAN CORTLAND
PARK
WOODLAWN
CEMETERY
BRONX
PARK
Truman
Childs
Clinton
Science
Kennedy
Walton
Roosevelt
Dodge
Columbus
Lehman
Monroe
Stevenson
Taft
Morris
Addams
Smith
Gompers
N
Potential Site
Vocational H.S.
Academic/Comprehensive H.S.
Selected Bus Routes
Subway Lines
Subway Interchange

LOCATION AND
TRANSPORTATION
PATTERNS FOR A
CAREER DEVELOPMENT
CENTER IN THE BRONX

Figure 4.5

any of the academic and comprehensive high schools. Finalized transportation patterns, with estimated travel times, can be established once a specific site is selected. The Metropolitan Transportation Authority can provide information on the best routes, via subway and bus, as well as estimated travel times.

4.6.2 Scheduling

When developing an operational plan for a CDC/COES, we are faced not only with the problem of making the CDC operational, but also with the problem of integrating all components of the system. This is particularly true when it comes to handling transportation, scheduling and coordination of students between schools. Several of these problems have been raised at various times, when different recommendations were made to make the occupational education delivery system more flexible and comprehensive. As part of its research effort, the COER Project paid particular attention to these problems. Staff members visited and conducted in-depth studies of the existing system in the Bronx, as well as the various out-of-town sites visited.

The CDC would utilize the Shared Instruction Program method of scheduling, which provides the liaison and coordination necessary for the exercise of all available options. Secondary level students, enrolled in their home school for the major portion of their programs, would travel to the CDC (which offers training not available in the home school). Students would be maintained on the rolls of their home schools and would earn credit toward a high school diploma by successfully completing a prescribed course. This type of scheduling permits:

a 1.5 mile radius -- a distance officially considered to be within walking distance by the New York City Board of Education. In addition, the subway system would provide access to either site, except for those schools east of Bronx Park. In these instances, the bus system could provide the necessary public transportation.

Were the Fordham Road site to be selected, eight of the high schools would be encompassed in the 1.5 mile radius. Students traveling from the South Bronx high schools have ready access to this site via the subway system. Those students from Truman, Lehman and Stevenson high schools would have to use the bus system.

The South Bronx site would encompass six of the high schools, with a seventh (Grace Dodge High School) lying just outside the 1.5 mile radius. As with the Fordham Road site, students outside the radius of the site have ready access via the subway system, including those students in the eastern Bronx. Only two school populations (those of Truman and Stevenson) would encounter any transportation problems. From Stevenson, a student would have to take a bus and then walk approximately one-half mile. Truman High School actually has no convenient access to the subways, as the New England Thruway separates the school and subway lines. A walk of approximately one mile would be required to reach a subway. This particular case would require the use of both the bus and subway.

The information sheets found in ATTACHMENT J represent examples of alternative transportation patterns which might be used between the Fordham Road site and

- normal day use when students are programmed to attend the Career Development Center during morning and afternoon periods of each school day;
- extended day use, both in the mornings and afternoons, which will maximize the use of the facility for day high school students as well as adults; and
- early morning and evening use of the facility in providing instructional programs for out-of school youth and adults.

The CDC would operate from 6 p.m. to 11:30 p.m. with programs being offered in either two or three period blocks. A typical day's schedule might be as follows.

	Population Served	
	Secondary Students	Out-of-School Youth and Adults
6:00 A.M. - 8:15 A.M.		X
8:30 A.M. - 10:00 A.M.	X	X
10:15 A.M. - 12:30 P.M.	X	
12:45 P.M. - 3:00 P.M.	X	
3:15 P.M. - 4:45 P.M.		X
5:00 P.M. - 7:15 P.M.		X
7:30 P.M. - 9:45 P.M.		X
10:00 P.M. - 11:30 P.M.		X

In terms of student flow, this system lends itself to accommodating the many schedules which exist in the City schools, and will permit students attending schools with split sessions to attend. A prototype for this type of scheduling currently exists in various forms in the City (e.g., the extended day of the Shared Instruction Program, the regular Shared Instruction Program, the After School Occupational Training Program, and the Part-Day Cooperative Education Work Experience Program).

By locating the CDC in either of the sites identified earlier, it would be accessible from any part of the Bronx and would facilitate the movement of students between schools.

Coordination of Students

Flow concerns have been raised with regard to the control and management of students between centers. However, experience in other cities with similar centers and prototype programs in New York City indicate that this need not necessarily be a real problem. While it must be agreed that New York City is larger than any other area studied, and is thus not comparable in terms of size, experience gained in the Shared Instructional Service Program (where students participating in the program exhibited increased attendance) indicate that programs and attendance records for the various courses would be maintained in a fashion similar to that experienced in Philadelphia (through the Centralized Information System).

The CIS Management Information sub-system would be utilized to coordinate the activities and programs of students. A system of computer ID cards could be used to monitor attendance at both the home school and the CDC. The cards would be inserted in a terminal in the CDC or home school which would record the time and date. The data would then be available at either the CDC or the home schools, as well as at central headquarters. In addition, the terminals could be used to report grades and course progress to the home school.

FOOTNOTES/CHAPTER FOUR

[1] A Plan for a Comprehensive Occupational Education System in New York, p. 19.

[2] Agenda for Action, A Report of the Guidance Advisory Council to the Board of Education, NYC, July 31, 1972, p. 64.

[3] Useful Practices, Guidance Program V-A, COER Project 1977.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

In accordance with the purpose and goal of the COER Project, recommendations and conclusions will now be presented relative to implementation of a Comprehensive Occupational Education System (COES) and its components in a specific area of New York City -- the Borough of the Bronx. These conclusions and recommended steps reflect the results of: (a) specific studies conducted as part of the COER Project; (b) a review of occupational education programs and systems in operation (or planned for operation) in metropolitan areas outside New York City; and (c) the experience of consultants associated with the Project.

The recommended steps, presented as subordinate to a series of conclusions derived as a result of the Project, are correlated with appropriate administrators in central offices of the New York City Board of Education. These administrators are those with decision-making responsibility relative to approval and support of actions associated with the development of a COES and related components, including a Career Development Center. Implementation of approved actions would be coordinated by the Center for Career and Occupational Education.

While the Borough of the Bronx represents the experimental area for the Project's studies, and while recommended actions are based, in large part, on studies associated with the Bronx, the recommended actions are equally applicable to the development of a COES in any other geographic area of New York City. (It should also be noted that a companion "external" document describes processes applicable to the development of similar systems, and career development centers, in any other large metropolitan areas of the nation.)

5.1 CENTRALIZATION

The present educational system in New York City functions, to a large degree, as an amalgam of separate and diverse units. This results in limitation of student options, as well as limitation of potential resources available to students and schools. The COER Project study identified a lack of centralized borough-wide responsibility for the maintenance, collection, analysis and dissemination of occupational education information, despite the fact that there are currently three computerized information systems in operation. These systems do contain parts of the required information, but they are not integrated into a single system.

Recommendations

- that a Comprehensive Occupational Education System (COES) be implemented as a viable educational delivery system to expand the training options for youth and adults;
- that a Centralized (computer-based) Information System (CIS) be developed which would have the capability of satisfying the educational system's needs with respect to information on students, training opportunities, job markets, and the like;
- that strategies be developed, and funding sources obtained, for implementation of the plan described in Chapter Three of this report, in increments consistent with defined priorities.

Related Action Steps

- obtain approval of appropriate administrators at the Board of Education to implement the plan, as presented in the Project report or as modified to reflect changing conditions;

- develop staffing patterns and procedures for continued planning and monitoring of progress in the implementation of the plan for a COES and its components, and for the procurement of critical information required for updating of the plan.

5.2 LABOR MARKET INFORMATION

In view of inevitable changes in the labor market, it is essential that those involved in planning for occupational education have current and projected labor market information which is in a usable form. Reliable labor market information is of such critical importance that a variety of processes should be employed. These include utilization of formal and published information from local, state and federal agencies, as well as informal job market surveys.

Recommendations

- that realistic and specific labor market needs be defined according to occupations and occupational areas, and used for the effective planning and implementation of occupational education programs. These needs should not only reflect numbers of potential job openings, but also the employers' expectations as to competencies of entering employees.
- that an ongoing process be established for the systematic collection, inventory, analysis and dissemination of job market information from all available sources, such as the Manpower Area Planning Council, the Bureau of Labor Statistics, and the New York State Department of Labor.
- that procedures be formalized whereby occupational programs, curriculum and guidance/counseling are kept current in reflecting the most recent information on labor market trends and skill requirements for various occupations.

Related Action Steps

- Special surveys of employers should be conducted on a continuing basis to obtain direct assessment of job opportunities and employee training requirements.

- Job market analysis should include state and national manpower needs as potential expanding areas of employment and geographic mobility.
- Advisory commissions and appropriate committees should be involved to a greater extent in providing advisory input regarding manpower needs and employment trends.
- Procedures should be developed for the start-up of new programs which take into consideration factors of educational value, sociological effectiveness and costs, with a major criterion being that of labor market needs and employment potential.

5.3 CURRICULUM

In an industrial and technological society which requires more complex skills, the means of acquiring same becomes fundamental to the entire learning process. This is especially true for occupational education. The concepts of clustering, modular instruction, and individualized occupational training based on open entry/open exit, have received a great deal of emphasis. These concepts offer potential for meeting the individual needs of students, increasing motivation for learning, and affecting the dropout rate of students disenchanted with education.

Recommendations

- that occupational education curricula be updated and developed such that, in view of the changing and complex needs of industry and youth, the potential for meeting the individual needs of students is given high priority.
- that the modular approach to curriculum be developed, with distinct units of instruction progressing from the simple to the complex, including the development and utilization of individualized learning packets for self-paced learning with the potential for open entry/open exit.
- that procedures be developed for increased utilization of representatives from business, labor, industry and community groups, in the development of curriculum materials consistent with labor market needs.
- that new and different curriculum models be initiated and evaluated as pilot programs at the magnet Career Development Center prior to broader application to the city school system.

Related Action Steps

- Continue and expand activities at the Curriculum Coordination Unit (Center for Career and Occupational

Education) in developing new curriculum materials and in updating existing curriculum materials to meet the changing manpower needs of the city, state and nation.

- Utilize curriculum resource materials of the State Education Department, the Regional Curriculum Center, the New York State Division of Correctional Services, and other groups involved in developing and testing curriculum materials.
- Support the development of curriculum materials which allow for maximum flexibility in enrollment of students in occupational programs.
- Expand the development of bilingual curriculum materials which will enhance student ability to progress in occupational education programs.
- Develop curriculum materials which will assist in the elimination of sex-role stereotyping in all occupational training programs.

5.4 INVOLVEMENT OF BUSINESS, LABOR, INDUSTRY, AND THE COMMUNITY

The Bronx Occupational Education Advisory Commission was formed to provide the necessary linkage between education and the community relative to training requirements of industry, program needs, opportunities for student on-the-job training and cooperative work experiences, etc. This Commission has suggested mechanisms and actions for increased involvement of industry and the community in order to improve the effectiveness of occupational education services.

Recommendation:

- that the collaborative involvement of business, industry, labor and the community be continued, refined and expanded as a prerequisite to the realization of a comprehensive and effective occupational education system.

Related Action Steps

- The functions of the newly-formed Bronx Occupational Advisory Commission should be defined and supported as a critical mechanism for the development and implementation of a COES in the Bronx.
- Plans, proposals and activities relating to the Bronx COES should be reviewed by the Advisory Commission for comments and recommendations.
- New and/or existing committees and commissions (associated structurally with the parent Advisory Council for Occupational Education) should be actively involved in program evaluation, curriculum development/updating, equipment requirements/changes, and job placement.
- Annual meetings and visitation days should be scheduled (preferably planned on an occupational

cluster basis), with open invitations extended to education, business, industry, labor, and the community.

- Industry and labor should be encouraged to include student participation in trade fairs, exhibits and other major events relevant to occupational training areas.
- Student occupational education clubs should be encouraged to plan an active role in the community, using their skills to assist in constructive community activities (e.g., beautification and repair programs, and other events which develop leadership qualities and further identify the role of the school and its relationship to the community).

5.5 PUBLIC RELATIONS

Based on the experiences of consultants and the results of studies conducted by the COER Project, it is essential that all persons involved with occupational education (students, parents, business representatives, community leaders, etc.) have an awareness and understanding of the purpose of, and processes associated with, its various programs. This is necessary for achieving the support required for an effective educational system.

Recommendation

- that systematic procedures for regular surveys of attitudes toward occupational education, the role of the Career Development Center, etc., be developed and implemented with representative populations being served by the Comprehensive Occupational Education System.

Related Action Steps

- The Attitudes toward occupational education on the part of the general public (including business, industry, labor and community leaders) should be determined through scientific surveys.
- An organized system for public information should be implemented based on the results of student attitudes. This effort should involve mass media, articles in publications available to Bronx residents, and articles in school publications.

5.6 GUIDANCE AND COUNSELING

The COER Project confirmed the view that, in large city urban education systems, greater effort must be devoted to career counseling and the identification of individual student needs which can be met by occupational education programs. Guidance services are required to assist individuals in the identification of career interests, in the selection of appropriate training programs, and in the development of a broad understanding of the world of work, on which future career decisions will be based.

Recommendation

- that a comprehensive career guidance and counseling system, including placement and follow-up services, be further developed and implemented, thus assuring that the totality of students needs are met.

Related Action Steps

- The activities of the Bronx Career Counseling and Resource Center, including referral, testing, counseling, placement and follow-up, should be supported and extended and, if possible, the facility should be located in an area of the Bronx which is easily accessible to all residents of the area.
- The guidance and counseling functions should be supported by a computer-based information system which would provide up-to-date information on training opportunities, employment opportunities and remediation programs, as well as programmed information to assist in career decision making.
- Funding should be provided to develop a comprehensive information system which could interface with other computerized information systems of the Board of Education, the Human Resource Administration, the State Education Department, and other agencies.

- The resources of business and industry, civic organizations and the community should be involved in supporting guidance and counseling services.
- An "employment profile" should be developed for each graduating student or for each student completing an occupational program, aimed at preparing the student with skills for entry- or upgraded-level employment.

5.7 STAFF DEVELOPMENT

While most of the occupational education staff in the Bronx are well acquainted with the operations and requirements of conventional education programs, there is every indication that specific in-service programs are required to prepare educational staff for the types of operations and activities to be included in the Comprehensive Occupational Education System. This is particularly true for the initiation and operation of a Career Development Center.

Recommendations

- that education staff be acquainted with the purpose and operations of the Comprehensive Occupational Education System, including the functions of its individual components.
- that a comprehensive personnel development program be designed and implemented to assure proper implementation of the Comprehensive Occupational Education System and the Career Development Center.

Related Action Steps

- Alternative approaches to in-service and pre-service training should be evaluated in light of COES/CDC components and functions.
- Personnel development programs should familiarize educators with business and/or community work situations. In the same manner, personnel development programs should be made available to business and community representatives to acquaint them with the operations and practices involved in the educational system.

5.8 ARTICULATION

Articulation and the interrelationship of education between all levels has become an issue of concern for educators. Not only are carefully designed articulation processes and programs of value in smoothing the transition of students between grade- and school-levels; they also evidence realization that education cannot be "locked into" a limited training environment. In the experience of the COER Project, articulation between the lower, middle and upper school levels is critical if students are to develop a proper understanding of occupational training options available at the secondary level. Furthermore, articulation programs between secondary and post-secondary levels are equally important and offer opportunities for a student's personal advancement, as well as overall economy of operation.

Recommendation

- that an effective Comprehensive Occupational Education System, involving students, educational staff and community representatives, should include processes and programs for articulation between grade- and school-levels.

Related Action Steps

- Committees should be instituted, with representation from all educational levels, for the specific purpose of studying and developing ways to improve the continuous progression of students between educational levels.
- A COES should include provisions for in-service programs, resources, etc., as a service to the teachers of sending schools in providing ideas and experience in planning for articulated programs.

- Formal programs should be developed to ensure that entering high school students will have developed: (a) an understanding of the occupational training opportunities available, and (b) the requirements and procedures involved in the student's gaining access to such programs.

- Articulation activities and programs, between secondary and post-secondary levels, should be continued and expanded in all disciplinary areas. Such programs should aim at avoiding duplication of offerings, the economic use of facilities and staff, and the provision of exposure and experiences in post-secondary programs to secondary students, consistent with their interests and abilities.

- Articulation activities should be developed between secondary programs and programs for out-of-school youth and adults which, while not part of formal college/university programs, provide students with advanced training for employment or employment upgrading.

5.9 MONITORING, EVALUATION AND ACCOUNTABILITY

In the management of any system, it is prerequisite that information be obtained and reviewed on an ongoing basis in order that those with overall responsibility have same for decision-making purposes. This information should be obtained through the evaluation of programs, and must be both formative, summative and, without exception, objective. Basically, the evaluation should utilize any process, instrument or technique which will factually determine accomplishments in accordance with the stated objectives.

Recommendation

- that a formalized plan be developed for monitoring and evaluating progress made in the implementation of the plan for a Comprehensive Occupational Education System in New York City.

Related Action Steps

- The Bronx Occupational Education Advisory Commission should be involved in the evaluation of progess in the implementation of activities associated with the plan, in recommending new programs, and in advising the Center for Career and Occupational Education on matters pertaining to the more effective and economic provision of occupational education services.
- A long-range system of accountability should be initiated which will indicate the progress made and the skills learned during a student's involvement in occupational education. Further, the system would indicate where the student is and how he has progressed in his employment after periods of one, two and three years (following completion of his program of study).
- A city-wide system of accountability should be developed whereby graduates of occupational education programs

are required to pass a standardized competency test for satisfactory completion of entry-level occupational education programs.

5.10 REMEDIATION AND SUPPORT SERVICES

For a number of reasons, large numbers of students and adults in the metropolitan areas require extensive remediation and supportive services in order to cope with the requirements of occupational courses and programs. As documented in this report, COER Project studies have indicated that occupational education programs must comprise elements of remediation for those students in need of such services.

Recommendation

- that a systematic process be developed and implemented, such that students requiring remediation and support services will be accommodated, thereby assisting students in the satisfactory completion of occupational programs and in coping with the constantly changing technologies which impact on reading, mathematics and communication skills.

Related Action Steps

- Curriculum objectives should be reviewed and revised, where necessary, to include the remediation of academic deficiencies necessary for the student to succeed in occupational programs.

- Formal procedures should be established whereby educational deficiencies relating to employment potential are detected early in occupational program involvement, and steps taken to correct such problems.

- The development of functional basic education materials should be a major priority within curriculum development. Such materials should provide the basics of reading, writing and mathematics in a curriculum correlated occupational training per se.

- The utilization of individualized learning packets and other materials/equipment should be considered as remediation and reinforcement items in support of teachers serving students with educational deficiencies.

- Workshops should be planned and implemented for the purposes of establishing (a) academic requirements to enhance employment potential and (b) the means for developing and providing them functionally in an occupational program.

5.11 HANDICAPPED AND BILINGUAL STUDENTS

The results of the COER Project studies show that large numbers of individuals with handicaps require occupational education and related supportive services. The existing educational system offers a wide range of services and programs for such individuals, but there is a demonstrated need for expansion of these services.

Recommendation

- that a Comprehensive Occupational Education System, recognizing the needs of the handicapped and bilingual, should make such programmatic, facility and curriculum adjustments as are required to accommodate the special needs of handicapped students.

Related Action Steps

- Existing programs of occupational education for handicapped students should be expanded in occupational areas which exhibit a reasonable expectation for employment.
- Local businesses and industries should be surveyed to determine (a) which are employing the handicapped and (b) the relationship of skills required and the employment possibilities for students with various handicaps.
- Expanded, formalized programs for placement and follow-up should be implemented, aimed at providing all possible support for each student.
- Concerted planning and coordinated efforts should be directed to developing and implementing occupational programs for students with limited English speaking ability. Educational staff involved in the delivery of occupational education services to handicapped and bilingual students should be required to enroll in staff development programs which would assist them in coping with specific problems of "mainstreamed" handicapped and bilingual students.

- The special nature of guidance and counseling services for the handicapped and bilingual should be evaluated and redirected as appropriate.

BIBLIOGRAPHY

Administrative Technology & The School Executive. *AASA Commission on Administrative Technology*. Edited by Stephen J. Knezewich. Published by American Association of School Administrators. 1201 Sixteenth Street, N.W. Washington, D.C.

Advisory Board for Vocational Education. *The Bridge Between Man and His Work.* U. S. Department of HEW, Office of Education. November 1968.

Advisory Council for Occupational Education. *Private Industry and Public Education*. Board of Education City of New York. VEA No. 21-82701.

American Institute for Research. *A Systematic Approach to Guidance. Planning Parafessional Programs*. Mesa Public Schools. Mesa, Arizona. 1976.

American Personnel and Guidance Association. *The Counselor's Role In Career Education*. April 1974.

American Vocational Association. *The Advisory Committee and Vocational Education*. Washington, D.C. 1969.

Amos, W. E. & Grambs, J. D. (eds.). *Counseling the Disadvantaged Youth.* New Jersey: Prentice-Hall, Inc. April 1974.

Armor, D. J. *The American School Counselor*. New York: Russel Sage Foundation. 1969.

Ashe, Amelia. An address at the Advisory Council for Occupational Education. "The Job Outlook in New York City: 1975 and Beyond." June 12, 1975.

Averch, H. *How Effective is Schooling?* California: Rank Institute. 1972.

Babbie, Earl, R. *Survey Research Methods*. Belmont California: Wadsworth Publishing Company. 1973

Bagin, Donald, Grazion, Frank and Harrison, Charles H. "School Communications: Ideas That Work." *Handbook for School Officials*. Chicago: Nation's School Press. 1972.

Bell, T. H. *The New Partnership-Academic and The World of Work*. ED 103 616.

Berg, Marvin. *Open Entry/Open Exit*. North Central Technical Institute. Wisconsin. 1976.

Berndt, W., Pritchard, D. *The National Guidance Handbook*. SRA. 1975.

Best, John W. Research In Education. New Jersey: 1970, 1959. Prentice-Hall, Inc., Englewood Cliffs.

Board of Education of the City of New York. *Annual Plan (1975-76) and Long Range Plans (1976-80) for Comprehensive Occupational Education in New York City*.

--------. *Comparative Analysis of The Organization of the High Schools for the Fall Term - 1975, 1976*.

--------. *High School Organization Report Oct. 1975, 1976*.

--------. *Report on Gradutes - 2-1-75 - 6-26-75 - July 1, 1975*.

--------. *Report on Pupil Attendance*. 1974-1975.

--------. Survey. *Annual Census of School Population, Summary Report on Ethnic Data - Oct. 31, 1975*.

--------. *Vocational High Schools Addendum to Supplement the Comparative Analysis of the Organization of the High Schools for the Fall Term-1975*.

--------. *School Profiles*. 1973-1974, 1974-1975, 1975-1976.

Bogg, David W. *Team Teaching*. Indiana University Press. Bloomington. 1966.

Borg, Walter R. and Meredith D. Gall. *Educational Research: An Introduction.* New York: David McKay Company, Inc. 1963-1971.

Boss, R. and others. *Review and Synthesis of Job Placement Literature.* Wisconsin: Madison Center for Studies in Vocational and Technical Education. March 1975.

Burt, Samuel M. *Industry and Vocationl-Technical Education.* New York: McGraw-Hill Book Company. 1967.

California State Advisory Council on Vocational Education and Technical Training. Sacramento. 1971-72. ED 026 789

Campbell, D. and Stanley, J. *Experimental and Quasi-experimental Designs for Research*. Chicago: Rand McNally. 1972.

Campbell, D.P. *Needed Research on Interests and Vocational Guidance*. ERIC. ED 113641, Jan. 1973.

Campbell, R.E. *Vocational Guidance in Secondary Education: Results of a National Survey*. Columbus, Ohio: Center for Studies in Vocational and Technical Education. Ohio State University. 1968.

Center for Vocational Education. *Abstracts of Instructional and Research Materials*. Aim/Arm. Volume 9. 1976.

Cobb County Board of Education. *Job Placement Service*. ERIC. ED 113494. 1974.

Columbia University, New York, New York. Center for Community Education. *Title I can Change Your School*. November 1970.

Board of Education, City of New York. *Community Schools Profiles*. 1973-74.

Congress of the United States, Washington, D. C. *House Committee on Education and Labor*. Vols. 1 and 2. November 1973.

Connecticut Labor Dept. *Bridgeport Area Occupational Outlook 1970-1980*. June, 1975.

--------. *Occupational Outlook 1970-1980-State of Connecticut*. October, 1974.

Cook, D. R. *Guidance for Education in Revolution*. Boston: Allyn and Beacon, Inc. 1971.

Cook, Jerry L. "Can Vo-Ed. Find Happiness with Industry?" *School Shop*. Vol. 34, No. 8. April 1975.

Cuban, L. "Community Participation and Urban School Reform." *Changing Education.* Vol. 6, No. 1. Summer 1974.

CVIS Distribution Center. *Computerized Vocational Information System Catalog*. Westminister, Maryland. 1976.

Davis, Albie. *How to Work with Advisories. Report No. 73*. ED 111 766.

Demik, Gary H. and Others. *The Development and Diffusion of the Training and Technology Program: A Decade of Development of Manpower Training-1965-1975*. Oak Ridge Associated Universities. Tennessee. Jan. 1975.

Department of Labor, State of New York. *Annual Planning Report Fiscal Year 1977, New York City*. New York, New York: Department of Labor, State Of New York. May 1976.

--------. *Applications and Openings; Unskilled Job Openings Report, Labor Research Report 1976*. New York, NY: Department of Labor, State of New York. November 1976.

--------. *Employment Review, March 1976 Vol. 29-No. 3*. Albany, New York: Department of Labor, State of New York. March 1976.

--------. *Estimating Sub-Area Unemployment in New York State; Labor Research Report 1974 - No. 6*. Albany, NY: Department of Labor. May 1974.

--------. *JOBFLO: A Report on Demand Occupations, Long Island.* New York, New York: Department of Labor, State of New York. August 1976.

Department of Labor, State of New York. *JOBFLO: A Report on Demand Occupations, New York City.* New York, NY: Department of Labor, State of New York. July 1975, June 1976.

--------. *JOBFLO: A Report on Demand Occupations, New York City.* New York, NY: Department of Labor, State of New York. August 1976.

--------. *Labor News Memorandum.* Monthly Reports. Albany, NY: Department of Labor, State of New York.

--------. *Manpower Projections; New York City, 1970-1980; Labor Research Report 1975-No. 11.* New York, NY: Department of Labor, State of New York. Jyly 1975.

--------. *Manpower Projections, New York State 1970-1980.* Albany, NY: Department of Labor, State of New York. January 1975.

--------. *Manpower Projections, Nassua-Suffolk, 1970-1980, Labor Research Report 1975-No. 10.* New York, NY: Department of Labor, State of New York. July 1975.

--------. *Manpower Projections, Westchester-Rockland, 1970-1980; Labor Research Report 1975-No. 13.* New York, NY: Department of Labor, State of New York. July 1975.

--------. *Annual Manpower Planning Report. Fiscal Year 1975, New York City.* New York, NY: Department of Labor, State of New York. Nov. 1973.

--------. *Area Manpower Review, July 1976 New York City SMASA.* New York, NY: Department of Labor, State of New York. July 1976.

--------. *Manpower Review, New York City,* A monthly newsletter. New York, NY: Department of Labor, State of New York.

--------. *New York State Annual Planning Report Fiscal Year 1977; Labor Research Report 1976-No. 6.* Albany, New York: Department of Labor, State of New York. July, 1976.

--------. *Occupational Shortages and Surpluses, New York City Area.* New York, NY: Department of Labor, State of New York. August 1975.

--------. *Occupational Shortages and Surpluses, New York City Area.* New York, NY: Department of Labor, State of New York. February 1976.

--------. *Occupational Patterns by Age - New York State 1970-1980. Labor Research Reports 1975 No. 19.* September 1975.

Developmental Career Guidance Project. *Career Education: A County Project. Career Education: The Resource Consultant. Career Education: Counselor Involvement. Career Education: Career Instructional Unit. Career Education: Hands-on Experience. Career Education: Media. Career Education: Testing.* University of Arizona, 1973.

Ellis, S. A Study of Career Centers in the State of California. Grossmont Union High Schoo. ERIC. ED 113 442. June 1975.

Fillmore, E.H. Goals and Objectives for Pupil Personnel Services. Hungtington Beach, California. 1974.

Flores, Robert R. "Wanted-Community Involvement in Education." School Management-15, December 1971. pp. 28, 29, 48.

Florida State Advisory Council on Vocational and Technical Education. Annual Evaluation Report: Fiscal Year 1975.

Franklin, Marian Pope. School Organization: Theory and Practice. Chicago: Rank McNally & Company. 1967.

Friel, Theodore. Student Guide to Career Decision Making Skills. Genesee Intermediate School District. Flint, Michigan. 1972.

Galant, R. Vocational Counseling of Disadvantaged Youth. ERIC. ED 105367. December 1974.

General Electric Co. Career Guidance Programs Handbook. ERIC. ED 110908. October 1974.

Granschaw, L. and others. Practical Career Guidance, Counseling and Placement for Non College Bound Students. Palo Alto: American Institute for Research in Behavioral Schiences. June 1973.

Gromacki, Chester. A Study of Current Practices and Development of an Advisory Committee Handbook. June 1966.

Guidance Advisory Council. Agenda for Action. Bureau of Educational and Vocational Guidance. New York City, Board of Education. 1971.

Hamburger, M, Wofson, H.E. 1000 Employers Look at Occupational Education, Report Number One, Occupational Curriculum Project. Board of Education of the City of New York. July 1969.

Hamlin, Herbert M. Citizens Committees in the Public Schools. Danville, Illinois: Interstate Printing Company. 1952.

Hapgood, Marilyn ED. Supporting the Learning Teacher: A Source Book for Teacher Centers. New York: Agatha Press. 1973.

Harris, J., ed. A Futuristic Concept of Vocational and Education Decision Making. ERIC. ED 098361. May 1974.

Harris, Joann. Computer Assisted Guidance System. National Vocational Guidance Association. 1972.

Hass, Glen, Joseph Bondi, Jon Wiles. Curriculum Planning - A New Approach. Boston: Allyn and Bacon Inc. 1974.

Henderson, G. "Role Models for Lower Class Negro Boys." Personnel and Guidance Journal. 1967. pp. 46, 6-10.

Hofstand, Richard K. and Phippa, Lloyd J. Advisory Council for Education: A Handbook. Urbana, Illinois. 1971.

Hoke, Fred, Max E. Jobe. Career Education Advisory Councils: A Plan for Development. Crasfordsville, Iniana. 1973.

House, E., Katzell, M. Facilitating Career Development for Girsl and Women. National Vocational Guidance Association. 1973.

Hoyt, Kenneth B. and others. Career Education: What it is and How to do it. Salt Lake City, Utah: Olympus Publishing. 1972.

Jacobson, T., Mitchell, A. Master Plan for Career Guidance and Counseling. ERIC. ED 112342. June 1975.

Jones, G. and others. The Logics of Planning Career Guidance, Counseling, Placement and Follow-up Programs. St. Louis: National Conference on Career Guidance and Counseling. 1973.

Kean, Michael H. Evaluation of Federally Funded Vocational Education Projects. 1973-1974. The School District of Philadelphia. 1974.

Kenneke, L. Promising Practices in Oregon. Oregon State University. 1976.

Kistler, Alan. "A Finger on the Pulse." American Vocational Journal. Vol. 50, No. 7. October 1975.

Labor News Memorandum. Vol. XXXII, No. 3-4, Jan. 19, 1977. "National Advisory Council on Vocational Education."

Law, Gordon. Contemporary concepts in Career Education. First yearbook of the American Vocational Association. Washington, D.C.: American Vocational Association. 1971.

Lewis & Lewis. The Community Counseling Concept. Focus on Guidance, Vol. 9. No. 3, November 1976.

Luckner, Barbara A., Zane, Lawrence F. Familiarization and Dissemination of Selected Vocationl-Technical Curriculum and Resource Materials. Hawaii University, Honolulu. June 1974.

Macmillan Information. The College Blue Book. Occupational Education. Sept. 1973.

Magisos, Joel (ED.) Career Education. Third yearbook of the American Vocational Association. Washington, D.C.: American Vocational Association. 1974.

Mallory, Alva E. Ed. The ECES III Evaluation Report. Genesee Intermediate School District. Flint, Michigan. 1976.

Marland, S. Career Education Now in Goldhammer & Taylor *Career Education: Perspective and Promise.* Columbus, Ohio: Charles E. Merril Publishing Company. 1972.

Marland, Sidney P. Jr. *Career Education: A Proposal For Reform.* New York: McGraw-Hill Book Company. 1974.

Marlowe, Donald C. and David W. Bogg III. *Flexible Scheduling: Using The Indiflexes Model.* Indiana University Press. 1965.

McKenna, Bernard H. *Staffing the Schools.* Bureau of Publications. Teachers College. Columbia University, New York. 1965.

McKinley, B. *Organization of a Career Information System.* Labor Market Information for Youths. Ed. by S.L. Wolfein. Temple University. 1975.

McKinnon, B.E. *Career Guidance Strategies in Arizona.* Arizona State Department of Education.

Mead, Margaret. *Culture and Commitment.* Garden City, New York: Natural History Press. Doubleday. 1970. p. 72.

Melville, Gary and Elmo Roesler. *The Business-Industry Survey Its Use In Institutional Planning.* U.S. Department of HEW.

Meyer, R. and others. *The Vocational Education's Role in Career Education.* ERIC. ED 107934. 1974.

Miller, A.J. Career Education Tenets. Paper presented at the National Vocational and Technical Teachers Education Seminar. Columbus, Ohio. October 1972.

Miller, J., Leonard, G. *Guidance Practices for Disadvantaged Youth.* National Vocational Guidance Association.

Mintz, R., Walz, G. *A Review and Analysis of Contemporary Guidance Services.* Counseling and Student Service Center. Ann Arbor, Michigan.

Missouri State Advisory Council on Vocational Education. *Third Annual Report.* ED 076 792.

National Advisory Council on Vocational Education. Eighth Report "A National Policy on Career Education." Washington, D.C. 1974.

New Jersey Department of Labor and Industry. *New Jersey's Manpower Challenge of the Eighties.* Trenton, NJ: New Jersey Department of Labor and Industry. March 1975.

New York/New Jersey Regional Conference. "An informed Notebook of Ideas for Education, Community, Industry, Labor Cooperation." Tarrytown, New York. February 1975.

New York Department of City Planning. Clerical Jobs in the Financial Industry in New York City. New York, NY: New York Department of City Planning. July 1972.

Nie, N., Bent, D. & Hull, C.H. Statistical Package for the Social Sciences. New York: McGraw-Hill. 1970.

Nordlund, W.J. Computer Assisted Placement System. ERIC. ED 107844. 1974.

Occupational Information System Grants Program. Standards and Guidelines. U.S. Department of Labor. Washington, D.C. 1974.

Occupational Outlook Quarterly. "The Counselor and the Negro Student." "The Negro's Occupational Progress." "New Jobs for Negroes." Vol. 4. December 1966.

Ohio State Department of Education. "Ohio Pride in Vocational Education, Parent and Student Survey." April 1971.

Ohio State Department of Education. Pride in Vocational Education and Guidance. ERIC. ED 113 576. 1973.

Olsen, J. The Role of Vocational Education. Columbus, Ohio: Center for Vocational and Technical Education. 1973.

Oil, Davis, Jr. ed. Perspectives on Curriculum Development 1776-1976. Association for Supervision and Curriculum Development. 1976.

Oldham, Neild B. Citizens Advisory Committees: Public Participation Increases. National School Public Relations Association. 1973. Arlington, Virgina.

Open Doors-1976. Busiess and Commnity Resources Available to New York City Schools. Printed by: Consolidated Edison. Developed by: Economic Development Council of New York City, NY. Chamber of Commerce and Industry, New York City Board of Education.

Oregon Career Information System. Keeping It Going. University of Oregon. Eugene, Oregon. 1976.

Patrick, Kenneth G. and Richard Eels. Education and the Business Dollar. London: The Macmillam Company, Collier-Macmillan Limited. 1969. p.4.

Patterns for High School Guidance. Board of Education, City of New York. June 1964. Bureau of Educational & Vocational Guidance.

Philadelphia Commission on Decentralization and Community Participation. Philadelphia Board of Education, Pennsylvania. July 1970.

Phipps, C. Guidance Planning and Evaluation for 1973-74. ERIC. ED 092836. 1973.

Pietrpfesa J., Leonard G. and Giroux R. Career Education and the Counselor. APGA. 1975.

Planning and Orgaization for Teaching, Project on the Instructional Program of the Public Schools. National Education Association. Washington, D.C. 1963.

Process Model for Developing a Multi-District Cooperative Career Education Program. Oregon State Department of Education.

Pucinski, Roman C. and Sharlene Pearlman Hirsch. The Courage to Change. Englewood Cliffs, NJ: Prentice-Hall, Inc. 1971.

Puerto Rico Advisory Council in Vocational and Technical Education. "Third Annual Evaluation Report, Fiscal Year 1972." San Juan.

Russell, Max M. The College Blue Book Occupational Education. Division of Macmillam Publishing Co. Inc. 1973 New York.

Schaefer, Carl, Kaufman, Jacob, and others. The Role of the Secondary Schools in the Preparation of Youth for Employment. Pennsylvania: Pennsylvania State University. 1967.

Schubert, J., Rosenfeld, M. Selected Functional Components of a Vocational Education Counseling System for Urban Youth. ERIC. ED 070854. September 1977.

Stern, B. Applications of Information Systems to Career and Job Choice. S.L. Wolfbein, ed. Temple University. 1975.

Sumption, Merle R., and Engstrom, Yvonne. School-Community Relations: A New Approach. New York: McGraw-Hill Book Company. 1966.

The Connecticut Labor Department, Employment Security Division. Bridgeport Area Occupational Outlook 1970-1980. Hartford, Connecticut: The Connecticut Labor Department. June 1975.

The Connecticut Labor Department, Employment Security Division. Occupational Outlook 1970-1980. Hartford, Connecticut: The Connecticut Labor Department. October 1974.

The House Committee on Education and Labor. "Reports on the Implementation of the Vocational Education Amendments of 1968." United States Congress, Washington, D.C.

The Personnel and Guidance Journal. "Guidance U.S.A.: Views From Abroad" edited by Leo Goldman. Vol. 53, No. 1. September 1974.

The Prot Authority of New York and New Jersey. Regional Perspectives: The Regional Economy: 1976 Review and 1977 Outlook. New York, NY: The Port Authority of New York and New Jersey. February 1977.

The Port Authority of New York and New Jersey. *People & Jobs; A Forecast of Population, Households, Labor Force and Jobs in the New York-New Jersey-Connecticut Metropolitan Region: 1975-1990*. New York, NY: The Port Authority of the New York and New Jersey. May 1974.

Tyler, Ralph W. *Basic Principles of Curriculum and Instruction*. University of Chicago. 1949.

University of the State of New York. The State Education Department. *What Should We Do With Our Senior Years?* A Report of the 1974-75 Commissioner's Student Advisory Committee.

Vocational Guidance Quarterly. March, 1973. Vol. 27, No. 3. "Students Who Lack Vocational Identity" Robert L. Harmon. "Poor People and Public Policy" Leonard Goodwin. "Students Seeking Good Work" E.L. Klingehofer. " Sex Differences in Adolescent Vocational Preferences" Helen Olive. March 1974. Vol. 22, No. 3. "A Systems Approach to Career Education" T. Antoinette Ryan. "What Ever Happened to Job Placement?" Thomas Flannagon. June 1973. Vol. 21, No. 4. "The Greening of Vocational Counseling" David J. Kuna. "Vocational Specialization & Occupational Placement" A Follow-up study by Carol M. Reich. "Career Advisors, Catalysts for Career Education" Wendal H. Jones.

Ward, D. *Careers: A Directory of Vocational and Technical Training Resources in Oregon.* ERIC. ED 101091. 1973.

Wardell, Nancy N. *Occupational Education Program for Training Prospective Directors and Supervisors.* 1971-1972.

Wasil, R. *Model for School Pre-Employment Activities*. ERIC. ED 106Y76. 1974.

Western Wisconsin Vocational, Technical and Adult Education. *Careermobile Project*. ERIC. ED 112202. May 1975.

Wilson, L. Craig. *The Open Access Curriculum.* Allyn and Bacon, Inc. 1973. New York.

Wolz, G., Smith, R., Benjamin, L. *A Comprehensive View of Career Development.* APGA. 1974.

Wolz, G. R. Impact: *Advancing Human Services.* Vol. 3. ERIC. ED 105355. December 1974.

Worthington, R. *Career Guidance-Educational Responsibility*. ERIC. ED 092 663. 1973.

Zimpfer, David G. *The Career Awareness Laboratory*. "Summary of Final Report" Singer Education Division, Career Systems. Rochester, NY. July 1975.

ATTACHMENT A

Excerpts from Position Paper No. 11, "Occupational Education, A Statement of Policy and Proposed Action by the Regents of the University of the State of New York", The State Education Department, Albany, New York, 1971

FOREWARD

"An educational system that is comprehensive and provides full opportunity must assist each individual to sustain himself through productive employment consistent with his abilities and interests. For nearly every person, work or the inability or failure to work, is a prime determinant of standard of living, family relationship, friendships, life style. community service, citizenship, and leisure time. Each individual's occupation is a major factor in his sense of control over his own destiny. In our complex technological, affluent society, this sense of control is remote if not unattainable without economic well-being, and without the knowledge that one is using his own powers to accomplish something of value to himself and others. For these reasons, the education we are developing in New York State must include a strong system of occupational education.

In this paper the Regents state their position on occupational education. The statement includes both short- and long-range guides for the development of occupational education. We urge support of the plan by legislators, the Governor, and all persons in the State concerned for our future environment."

Edward B. Nyquist
President of the University and
Commissioner of Education

POSITION OF THE REGENTS

"To guarnatee an adequately prepared work force, and productive employment for all who are able and willing to work, New York State will need to fashion a comprehensive system of occupational education programs and services. Such a system will be comprehensive in that it will serve the occupational education needs of all persons in the State, including persons attending non-public schools, and in that it will utilize all available resources for occupational education, in a coordinated, nonduplicative, and cost-effective manner."

"The system will provide a continuum of occupational education programs and services, beginning in early childhood and extending through all instructional levels, including adult and continuing education. Components of this continuum will be designed to ensure development of student characteristics at approximate key ages; for example:

> By age 9, the student understands the concept of work, appreciates the value of work and the worker, and is familiar with a wide variety of kinds and fields of work.
>
> By age 12, the student is familiar with the broad families of occupations, is aware of the prerequisites for employment in the various kinds and fields of work, and understands the ways of progressing from one occupational level to another. He is developing awareness of his own abilities, interests and aptitudes in relation to various occupations.
>
> By age 15, th student is able to assess his own potential and to participate in making informed decisions regarding his immediate educational and occupational goals. His options include access to occupational programs which prepare him for immediate employment upon graduation, for continued occupational education at the post-secondary level, or for exit to the labor market prior to graduation.
>
> By age 18, every student is able to choose and plan the next step in his occupational and educational career. The occupational education student is able to obtain entry-level employment in occupations for which he is trained, and/or to enroll in post-secondary occupational education.
>
> By age 21, and for as long as he is able and willing to work, every individual is employed in a position commensurate with his skill development, and is able to select from continuously accessible preparatory and remedial programs which provide training and retraining for employability, advancement, job security, and mobility, appropriate to his talents, interests, and needs."

"Any student will be able to choose an occupational education program with assurance that he is increasing his future options, if:

> there is a strong bond between occupational and academic education, so that students completing occupational programs have sound backgrounds in both occupational and basic educational skills.
>
> the trend continues toward preparation of secondary students for work in families or broad clusters of occupations, rather than for specific jobs alone.
>
> the scope of occupational education at the secondary level continues to broaden, so that students with a wide range of interests and abilities are able to obtain preparation for occupations of their choice.
>
> more programs are specifically designed to prepare secondary occupational education students for continued study at the post-secondary level, and articulation between programs at the two levels increases.
>
> occupational programs are relevant, in the sense that they prepare students for occupations in which employment opportunities exist or are emerging, and reflect the actual requirements for entering and succeeding in those occupations.
>
> all students electing occupational programs have reasonable assurance of employment upon completion. This assumption implies that every occupational education agency, including secondary schools, will either act as an employment service in placing its own graduates, or facilitate placement through effective relationships with existing employment services.
>
> all barriers are eliminated which prevent any persons, such as members of racial minority groups, from enjoying equal opportunity for employment and career advancement.

Since maturing students must have the right to modify educational and occupational decisions, both the occupational education system and the larger educational system of which it is a part must be sufficiently open and flexible to allow changes in direction with a minimum of frustration and penalty. The system must facilitate movement across occupational curriculums, and movement in both directions between occupational and non-occupational curriculums.

The right to modify decisions must include the opportunity for honorable exit from and reentry to the formal educational system without penalty. The system needs to give as much attention to the "dropout" or "pushout", as to the student who completes his education in the traditionally prescribed fashion. While improved educational programs promise to decrease the alarmingly high attrition rates in our secondary and post-secondary schools, alternative educational experiences and services are needed by the student who cannot benefit from continued formal schooling at a particular time in his life. It is the system's responsibility to assist such a student in obtaining employment and/or further training outside the regular school curriculum, and to encourage and facilitate his reentry whenever he is prepared to return."

CONCLUSION

"The major concepts in the Regents policy concerning occupational education are:

> that New York State needs to develop a comprehensive system of occupational education serving all persons in need of occupational preparation through utilization of all available resources, public and private, which offer such preparation;
>
> that a comprehensive occupational education system will make available to every person a continuum of educational opportunities beginning in early childhood and extending beyond high school for as long as that person needs or desires such opportunities;
>
> that occupational orientation in the elementary, middle, and early secondary years will provide all students with the basis for informed decisions regarding their occupational and educational plans for the immediate future;
>
> that occupational education services for adults and out-of-school youth will be expanded and improved through more orderly arrangements which eliminate wasteful competition and duplication of efforts;

that all occupational education programs will be conducted within the framework of a State and regional planning process, coordinated by the State as part of its overall responsibility for education, and involving all levels of government and all agencies or groups which operate or are affected by occupational programs."

ATTACHMENT A-1

VOCATIONAL EDUCATION IN THE 70's

A Statement and a Projection for New York City

VOCATIONAL HIGH SCHOOL PRINCIPALS ASSOCIATION
OF NEW YORK CITY

February, 1971

Printed at THE NEW YORK SCHOOL OF PRINTING
by MR. IRVING SPECTOR and MR. JOHN DEMEO

VOCATIONAL EDUCATION IN THE 70's

A Statement and a Projection for New York City by the Vocational High School Principals Association

1. *Purpose of This Statement*

In this era of crisis and change, it is time to take a fresh look at the role of our vocational high schools in the City of New York. We all agree that boys and girls entering senior high schools in our city should be able to make choices from many types of programs, both vocational and academic. Thus they are entitled to the opportunities and benefits of a comprehensive high school system that is possible in a city of the unique size of New York. One approach, which appears to have been rejected as rigid and impracticable, is to remodel every high school into a predetermined comprehensive high school pattern. A second approach is to maintain and develop a variety of schools—some mainly academic, some mainly vocational—so that our children will have all the advantages of a comprehensive high school system within a more flexible framework. Our purpose is to examine the present and the future of vocational high schools as a vital part of the second plan.

Such an overview, in order to be meaningful, must include three aspects:

A recapitulation of those *current values* which must be preserved.

A search for the *directions* in which our vocational high schools should move so as to provide services commensurate with the needs of our students for today and tomorrow.

The *fundamental requirements* essential to a program of quality vocational education for New York City in the coming decade.

2. *Current Values of Vocational Education*

There is no question but that vocational education should undergo and has been undergoing a process of change. The same is true of all types of education on every level. However, no matter what changes take place, there are certain lasting values which cannot be cast aside:

a. Every youngster entering a vocational high school has at least one *clear goal*—to become proficient in some occupation. While this should by no means be his only goal, it acts as an important motivating force.

b. As a result of having a goal that is attainable within a reasonable length of time, vocational high school students are more likely to *remain in school* and profit from their education.

c. The vocational high schools, as college-entrance statistics indicate, offer a *dual purpose* to students. They can get not only the training required for a skilled job but also those courses preparing them for higher education. Often their occupational proficiency makes it possible for them to earn the funds they need to continue in college.

d. Work in the shops involves *individualized instruction*, to a large extent, and a chance for each student to proceed at his own pace. In addition, students are dealing with concrete tasks and real equipment and materials.

e. *Trade teachers add vitality* to the faculty and to the educational program because they bring to the school and to the classroom the actualities of practical experience in business or industry.

f. Because the vocational high schools draw applicants from wide geographical areas, *students enter these schools by choice*, and not by the chance factor of living in a particular neighborhood. A further feature is the *integration* of young people of different backgrounds from different communities.

g. Our vocational high schools tend to be *smaller and more intimate organizations*, in line with the current concept of optimum size for a secondary school.

h. The vocational high schools are *community schools* in that they maintain a *close liaison with labor and industry* through the Advisory Council for Occupational Education, the various trade commissions, the contacts made by individual schools, and the many cooperative and work-experience programs.

i. *Services* are provided *beyond the regular school day* to out-of-school youth seeking job training, to students from academic schools and parochial schools and to adults in need of new skills or upgraded skills.

j. The record shows that the vocational high schools accomplish their stated goal: *they place their students in jobs*. The resulting benefits accrue to the students, to the nationwide fight against poverty and to the economy as a whole.

k. In these days of student unrest and dissent, the *vocational high schools have been relatively calm and stable*. Like all schools, they have had problems but within a manageable or negotiable range. The chief reason for this phenomenon may well lie in an overused but appropriate word: the *relevance* of the vocational and educational offerings.

3. *Directions for Vocational Education and Our Vocational High Schools*

We believe that the values enunciated here are ample justification for support of the vocational high schools by the community and by those in decision-making positions. However, the worst disservice we could perform would be to stay where we are. Our high school youngsters of the 70's deserve much more.

The fact is that in spite of errors in policy during recent years, our schools have been constantly making changes and trying innovations to increase flexibility of curriculum and to meet the emerging needs of our students. The new vocational courses that have been introduced and the major modifications of existing courses bear witness to our efforts. But the 70's require thinking and planning in new directions that will supply still more individualization, still more flexibility, and more attention to programs adjusting the curriculum to the student instead of fitting the student into the curriculum, while at the same time meeting the changing needs of business and industry.

Our proposals are derived largely from the following references:

> *The Changing Curriculum and Innovative Programs* issued by the high school superintendents in September 1970.
>
> *A Proposed Plan for the Reorganization of the Secondary School Program of New York City* issued by our association, January 12, 1967.
>
> *Ideas expressed or submitted by members of our association* and other resource persons.
>
> *Innovations already begun in our vocational high schools.*
>
> Our awareness of *experiments in progress* elsewhere, the *writings of educational leaders*, the *views of young people* throughout the nation, and the *upheavals in our society*.

With these considerations in mind, we present the elements of a meaningful and viable program for the vocational high schools and vocational education in the City of New York:

a. *Liaison with the community colleges and the senior colleges*, particularly of the City University. There should be better publicity regarding opportunities in the community colleges for our graduates to pursue advanced work in their fields of occupational specialization. For example, cosmetology graduates can learn small business management and administration as well as college chemistry and more complex practices in cosmetology. Another feature of articulation should be *advanced placement courses* in occupational areas.

Links should also be established with the senior colleges broadening the concept of vocational preparation to encompass *fields that require licensing or training in the college or university*, for example, in law, accounting, foreign language translation, architecture and teaching. This approach is followed to some extent in a few fields now, for instance, in aeronautical engineering and data processing.

A further implementation of effective articulation with the colleges should be the granting of *scholastic credit for vocational and technical courses.* By overlooking the scholastic demands of such courses in English, mathematics and science, institutions of higher education are discriminating unjustly against able graduates of the vocational high schools.

b. *Post-graduate education and training in trade areas.* At present, the main form of this training is a pre-employment program comprising 1200 hours or one year of intensive shop work. This service should be expanded to include a 13*th and* 14*th year* for students beginning their vocational training as juniors and seniors and wishing to gain high occupational competence.

The 13th and 14th years would thus provide further preparation for students who are not yet ready for college or for profitable employment. The work would be on a high school rather than a college level, so that the purposes and functions would be ones neither supplied by nor appropriate to the colleges.

c. *Expansion of academic education and more stress on the general-education values of vocational courses.* More than ever, academic competence and human relations are as indispensable to vocational success as specific occupational skills. The vocational high school principals recognize this truth and are making every effort to enrich curriculum and instruction accordingly.

d. *Utilization of the community as a resource center so as to extend education and curriculum beyond the walls of the school.* For all students but especially for those who will perform more successfully in a freer environment, we should expand trips to industry, work-study and work-experience programs, placement in part-time jobs for which school credit can be granted, and similar activities.

An important corollary of this program is a closer *working partnership with labor and management*, so that *credit* will be given not only by the school for outside jobs held by students but also by labor and industry *in apprenticeships for qualified vocational high school graduates.*

e. *Individualized screening and guidance for admission to vocational courses.* Screening procedures have become increasingly systematic and refined, but greater emphasis should be placed on counseling and pupil motivation and on special characteristics essential to success in the occupation; for instance, emotional stability in nursing, mathematical aptitude in electrical installation and practice, physical stamina in automotive mechanics, technical English in stenography. Also, since selection procedures will always be imperfect, arrangements have been eased and should be eased further for transfer without penalty from one trade curriculum to another.

However, screening of applicants should be only one part of an overall guidance process in which pupils will be given *greater information and orientation in the lower schools; vestibule programs in reading and mathematics* will be expanded for academically retarded students in the ninth and tenth year; *additional help and resources* will be provided *for students with language handicaps;* and appropriate *training programs* will be developed *for the less-than-skilled student* who has the interest and potential to profit from preparation in an occupational field of his choice.

These are but a few examples of what should be included in an integrated system of *personalized guidance and counseling services* for students on all ability levels who enter the vocational high schools or who seek training in occupational areas.

f. *Flexibility in enrollment procedures and in curriculum;* for example:

1) Qualified students should be *admitted* to vocational programs at the grade or level *where they demonstrate readiness*, as identified by their aspirations, their potential, their goals and their aptitudes.

2) *Enrollment* in vocational courses should be *allowed periodically* throughout the year.

3) Except where time allotments are fixed by state or other licensing requirements, *progress* in vocational courses and successful completion should be *judged by individual competencies.*

4) Vocational curriculums should be varied so as to provide for *one-year, two-year and three-year sequences.* In this way, students could select and complete a sequence commensurate with the time they entered the program and the level and degree of competence desired.

5) For some students, usually at lower or higher levels, a *multi-skill approach, developing skills applicable in a number of fields*, should be tried in place of concentration on a single occupational area. Experiments now in progress should be watched and evaluated and others should be initiated in selected schools.

6) *Dates of completion* of vocational courses should be *flexible* and independent, where feasible, of the academic year. Certificates of accomplishment or other types of recognition should be granted throughout the year depending on individual achievement.

7) *Endorsed certificates of competence should be issued to students meeting standards for employment in the occupation*, in addition to any diploma that is earned. It should be noted that the recommendation for issuance of a uniform high school diploma, along with certificates of competence, was made in the report submitted by our association, January 12, 1967.

g. *Pilot projects and other forms of experimentation designed to provide individualized programs and activities.* Among these would be *seminars*, with *individual projects; non-graded classes; student-exchange programs* in vocational fields; *open programs* for selected students, with shop as the only required subject (with special approval). In the case of an "open program," the remainder of the classes and activities would be arranged, in consultation with the student, to meet his individual wishes and needs.

A few schools should experiment with *"phases" in vocational courses*, as in academic subjects in John Dewey High School, so that after each phase of seven or eight weeks, the student would move on to the next phase if he has demonstrated mastery. Other time divisions should be attempted; e.g., dividing the academic year—*or the entire twelve months of the year*—into three or four parts, that is, into a *trimester* or *quarterly* pattern. Such approaches would leave more freedom for students to proceed at their own pace.

Also, if the Chancellor's proposed budget is approved, one or more vocational high schools should be involved in the program of *individual and independent student study and activity*, to be financed in $100,000 units.

h. *Additional programs in the vocational high schools for the community*, such as: training for adults, where room permits, during the regular school day; short-term and long-term retraining courses, day and night, for out-of-school youth and adults; in cooperation with business and industry and in accordance with individual needs; special programs as needed by industry, the armed services, labor unions and other segments of society; courses for the Manpower Development and Training Program; half-day programs for students from academic and parochial high schools; other skills programs in the manner of BOCES (Bureau of Cooperative Educational Services);

training for the physically handicapped; etc. Many of these programs are in operation now in vocational high schools, but for full service to the community, they should be extended and intensified.

i. *Planned and systematic evaluation and research,* possibly with the help of an agency like the Educational Testing Service for both vocational services in general and such specific objectives as appraisal and improvement of the exploratory program, selection of students for courses, and determination of occupational competence.

4. *Fundamental Requirements for Effective Vocational Education*

The foregoing suggestions are by no means a finished blueprint but rather an indication of what can be done in the vocational high schools to provide flexibility and individualization within a meaningful structure. It would be a serious error to vitiate the sequential training that is necessary to the development of occupational competencies. On the other hand, the possibilities within any sequence must be sufficiently broad, varied and imaginative to meet the individual differences of adolescents in motivation, ability, maturity, purpose and circumstance.

However, no matter how well we plan or work, our endeavors will be hamstrung without the support of higher authority. This support, which is vital to the students entering our schools, must be expressed by the fulfillment of fundamental requirements—requirements necessary to successful vocational education now and in the future:

a. The assignment of an *assistant superintendent* to administer and coordinate vocational education programs throughout the city and to supervise the vocational high schools. The directors of trade and technical subjects and of business education would also work under his supervision.

b. Steps toward the creation of a *central agency* to be responsible for the organization and administration of all vocational programs. Such an agency is essential for various reasons: the breadth and complexity of occupational education; the dispersed labor market; the non-zoned character of the pupil population; the tremendous costs of quality vocational programs; and the need to insure the proper federal and state funding of vocational programs. Further study is needed to work out the specific structure and functions of this central vocational-education agency.

c. *Prompt implementation of recommendations of the Advisory Council for Occupational Education,* based on their continuing study of industrial, business and labor trends, with respect to shifts in employment needs in every occupational area; new training needs and emerging jobs and careers; corresponding changes in courses and curriculum; and minimum standards of equipment and physical facilities for the proper conduct of vocational education programs.

d. The building of a number of *additional vocational high schools* and the modernization of existing vocational high schools. To provide adequate services and facilities for students entering vocational programs at various levels, to maintain single-session organizations and to extend training programs for adults, more vocational high schools are a prime requisite. An increased number of modern multi-trade schools are needed to respond flexibly to newly emerging trades. Additional unit trade schools are needed for coordination and upgrading of established vocational fields, for example, medical arts.

e. *Adequate provisions for quality education in skilled trades,* wherever such courses are offered. These provisions should include:

1) *Shops of suitable area, height and flooring,* with equipment and facilities consistent with industrial standards. These standards necessitate maintenance of facilities and equipment, continuous updating of facilities and equipment and removal of obsolete machinery—through adequate funding, through arrangements for donations of equipment from industry, and through any other practicable means.

2) *A sufficient number of shops* for each vocational course to provide for individual variations and needs.

3) *Licensed and qualified teachers* with a minimum of five years experience in the trade on at least a journeyman's level; also, *licensed and qualified supervisors and administrators.* Furthermore, trade teachers should be enabled and encouraged to keep abreast of new trends and developments in their field through opportunities for continued work experience, by means of sabbatical leaves, training programs held in cooperation with industry, special institutes and workshops, placement in jobs during vacation periods, and other appropriate arrangements.

In planning and carrying out these provisions, it is paramount that vocational education not be confused with industrial arts in regard to chief goals, facilities and personnel. To do so would only weaken immeasurably the standards and effectiveness of both areas.

f. Ample provisions for *funding of vocational education* utilizing all available resources of the federal government, the state and the city. Without sufficient funds, the best conceived plans for vocational education are doomed to failure.

g. Extensive and thoroughgoing liaison, through the central agency, the Assistant Superintendent for Vocational Education and the Advisory Council for Occupational Education, *with agencies outside the school system of New York City;* the Department of Labor, the state Board of Cooperative Educational Services, the trade unions, the American Vocational Association, etc. These contacts should be accompanied by the expansion of job counseling and placement services in the vocational high schools.

h. The *use of all facilities* in the vocational high schools before surrendering vocational programs to other schools or agencies. Examples of these programs—for pre-employment, retraining, and upgrading of skills—have been given (see Part 3, Subdivision h). Where there is room in vocational high schools, it saves money and makes sense to utilize available facilities and to employ personnel known to be trained and qualified.

i. The inclusion of the vocational high schools in *all projects that will be of benefit* to the students. At present, the vocational high schools get no share of funds or personnel for such activities as the College Bound Program, the College Discovery Program and the School to Employment Program, and a highly limited share of other activities such as the Pre-Technical Program. If youngsters in the vocational high schools do not receive the services of these and other projects in fair proportion, they are being short-changed.

5. *Commitment to Vocational High Schools*

Above all, if the vocational high schols are to preserve their present values and move forward so as to serve students effectively in the 70's, we must have a commitment to their status as permanent institutions and to their high priority in the overall plan for secondary education. This commitment must come from the Chancellor and the Board of Education. Then we can meet with officials and community members and join in the formation of coordinating committees to develop and bring into fruition the programs that are agreed upon as desirable. We cannot afford any longer to see vocational education for our students stalled dead-center in New York City while proceeding full steam ahead elsewhere in the state and in the nation.

The vocational high school principals stand ready to participate and to act. Our aim, while it embraces vocational education and the schools that we head, is not confined to these alone. We want to do our part in bringing the best possible education to children in the City of New York.

ATTACHMENT B

Methodology

Educational Needs Assessment - Secondary Age Target Population

The estimate of the Universe of Need, presented in the Educational Needs Assessment - Secondary Age Population, were derived from existing data, where available. In those instances where data was not available, estimates were developed based on available information and knowledge of the workings of the system.

Data was available on the handicapped secondary age population and its component parts in the Bronx, so that it was used as reported. Also available from the Bureau of Labor Statistics, in Report #481, "Geographic Profile of Employment and Unemployment, 1975" was an estimate of the number of unemployed 16-19 year olds.

The major obstacle in data collection related to needs of the In-School Secondary Age Population. As no hard data was available to determine the need for occupational training for this group, a methodology was developed to estimate this need. This approach was used in arriving at a profile of the graduates of the high schools, i.e., the number or percent of students: (a) entering labor force, (b) entering post secondary training, (c) who drop out of high school and who drop out of post secondary training.

The methodology used in determining the "Need" for the In-School Secondary Population is based on the following assumptions:

- That the public and non-public high school populations are identical in terms of drop-out rate, percent of graduates percent of enrollees in post-secondary institutions and percent of non-completers in post-secondary institutions.

- Of those students currently enrolled in the high schools (public and non-public) 35% will not graduate. This is based on approximately 240,000 graduates over the next four years out of a total (public and non-public) current enrollment of 380,000.

- Of those who graduate from high school, approximately 60% will enroll in post-secondary institutions and 40% will enter the labor force. This is based on the report of the City University of New York entitled "Application, Allocation, and Enrollment of CUNY Freshmen: 1970-1974" dated July, 1976. This is the only data available on applications and admissions to post-secondary institutions of high school students in New York City. They report that in 1974, 60% of those who applied to CUNY actually enrolled. While, in fact only 85% of the public high school graduates applied and CUNY reported that 60% of those who applied actually enrolled, or 51% of graduates enrolled, it was felt that the 60% figure for actual enrollments was probably closer to reality.[1]

  It is common practice in New York City for students who plan on attending college to apply to CUNY whether they plan to attend CUNY or not. CUNY has an open admission policy so that a student who graduates high school is guaranteed admission. Students apply to CUNY as a backup should their application to other colleges be denied. In so doing they deflate the CUNY percentages because many who apply to CUNY and do not enroll actually enroll elsewhere.

- It was assumed that approximately 40% of those who enroll in post-secondary institutions will not complete their training and therefore need occupational training. As no data was available for New York City the national average was used.[2]

Starting with the fall 1976 public and non-public high school enrollments, the above assumptions were applied to arrive at the figures presented in the "Universe of Need - Secondary Age In-School Populations".

---

1. Report on Graduates, New York City Board of Education, June, 1975.

2.

The computations used for New York City and the Bronx were the same so that an illustration of the computation for New York City will serve for both:

Total N.Y.C. High School Enrollments (Oct. 1976)		379,000
Estimated annual total number of high school students in need of training:		
1. 35% of High School Enrollees who will not graduate (drop-out)	133,000	
2. 40% of graduates will not enroll in post-secondary institutions	98,500	
	231,500	
40% of graduates entering post-secondary institutions will not complete program	59,200	

Total High School Enrollment (Fall, 1976)	379,000	
	x .35	
	133,000	will not graduate h.s. (dropout)
	247,000	will graduate h.s.
	x .60	
	148,000	will enroll in post-secondary institution
	x .40	
	59,200	will not complete post-secondary training
	39,600	will complete post-secondary training

ATTACHMENT C

OCCUPATIONAL PROGRAM OFFERINGS, THE BRONX

OCCUPATIONAL PROGRAM OFFERINGS, NEW YORK CITY

Table I

Occupational Course Offerings in the Academic/Comprehensive High Schools in the Bronx

HIGH SCHOOLS IN THE BRONX

	Lehman	Roosevelt	Walton	Columbus	Childs	Morris	Taft	Stevenson	Clinton	Truman	Monroe	Science
Agricultural Programs				X					X			X
Business & Distributive Ed.	X	X	X	X	X	X	X	X	X	X	X	
Exploratory Programs	X	X	X	X	X	X	X	X	X	X	X	
Bookkeeping	X	X	X	X	X	X	X	X	X	X	X	
Distributive Ed.	X	X	X	X	X	X	X	X	X	X	X	
Secretarial/Stenographic and General Office	X	X	X	X	X	X	X	X	X	X	X	
Data Processing				X		X						
INDUSTRIAL ARTS	X	X		X	X	X	X	X	X	X	X	X
HEALTH PROGRAMS	X	X	X	X	X	X	X	X	X		X	
Exploratory Programs	X	X	X	X	X	X	X	X			X	
Health Assistants	X	X				X						
Practical Nursing	X					X						
Geriatrics			X									
Medical/Dental Secretarial			X									

	Lehman	Roosevelt	Walton	Columbus	Childs	Morris	Taft	Stevenson	Clinton	Truman	Monroe	Science
HOME ECONOMICS	X	X	X	X	X		X	X				
Child Care Occupations	X	X	X		X		X	X				
Clothing Occupations		X	X	X	X		X					
Food Occupations		X	X	X	X		X					
Consumer Education			X									
Home Occupations	X											

Table II

VOCATIONAL COURSE OFFERINGS IN THE BRONX

	VOCATIONAL HIGH SCHOOLS			
CITY-WIDE TOTAL	GOMPERS	ADDAMS	SMITH	DODGE
9TH YEAR EXPLORATION	X	X	X	X
HEALTH PROGRAMS	X	X	X	X
BUSINESS & DISTRIBUTIVE EDUCATION		X		X
COSMETOLOGY		X		X
AUTOMOTIVE TRADES			X	
BLUE PRINT READING			X	
ENVIRONMENTAL CONTROL TRADES			X	
COMMERCIAL PHOTOGRAPHY				X
DRAFTING TRADES			X	
DRIVER EDUCATION			X	
ELECTRICAL/ELECTRONIC TRADES	X			
FASHION TRADES		X		
FOOD TRADES		X		
PRINTING TRADES	X			
ELECTRO-MECHANICAL TRADES	X			
AVIATION TRADES				
CLOCK & WATCH REPAIR				
COMMERCIAL ART TRADES				
DENTAL LAB				
INTERIOR DECORATION				
JEWELRY MAKING TRADES				
MARITIME TRADES				
METAL TRADES				
SILK SCREEN				
SPECIAL TECHNOLOGIES				
UPHOLSTRY				

Table III

REGISTER-FULL TIME VOCATIONAL STUDENTS
DISTRIBUTION BY GRADE AND SCHOOL

OCTOBER 15, 1976

SCHOOL	9th GRADE	10th GRADE	11th GRADE	12th GRADE	TOTAL
Art & Design	507	818	690	421	2,436
Chelsea	268	359	301	202	1,130
Food Trades	484	450	248	162	1,344
Fashion Industries	795	912	464	308	2,479
Mabel D. Bacon	212	439	304	287	1,242
Manhattan	499	646	342	234	1,721
N.Y. Printing	456	567	391	401	1,815
Norman Thomas	427	1,094	973	534	3,028
Alfred E. Smith	598	634	324	248	1,804
Grace Dodge	431	634	499	496	2,060
Jane Addams	435	485	343	269	1,532
Samuel Gompers	373	653	293	239	1,558
Alex. Hamilton	317	538	279	127	1,261
Automotive	468	452	416	314	1,650
Clara Barton	567	728	636	391	2,322
East New York	642	561	304	223	1,730
Eli Whitney	595	898	649	531	2,673
G. Westinghouse	398	788	447	418	2,051
Sarah Hale	779	663	446	434	2,322
Wm. E. Grady	343	818	467	395	2,023
Wm. Maxwell	508	576	386	333	1,803
Aviation	632	784	682	603	2,701
Queens	203	455	334	304	1,296
Thos. Edison	249	771	441	541	2,002
McKee	479	340	221	251	1,291
TOTALS	11,665	16,063	10,880	8,666	47,274

Source: Addendum to Supplement the Comparative Analysis of the Organization of the High Schools for the Fall Term 1976.

Note: Clara Barton and Sarah Hale have since been designated Comprehensive High Schools and were subtracted from these total for use in Chapter II.

Table IV

REGISTER-FULL TIME VOCATIONAL STUDENTS
DISTRIBUTION BY GRADE AND COURSE

OCTOBER 15, 1976

COURSE	9th GRADE	10th GRADE	11th GRADE	12th GRADE	TOTAL
9th Yr. Exploratory	10,010	574			10,584
Auto Mechanics	38	1,149	784	592	2,563
Automatic Heat. Mech.		176	124	97	397
Aux. Health Asst.		152	303	291	746
Aviation Mechanics		972	787	701	2,460
Baking		32	36	24	92
Bio-Medical Lab.			102	65	167
Business Mach. Repair		158	120	77	355
Cabinet Making			348	336	684
Cafeteria & Catering		182	72	24	278
Carpentry		150	124		274
Clock & Watch Mechanic		37	18	8	63
Commercial Art		818	524	123	1,465
Com'l. & Domes. Refrigeration		122	70	35	227
Com'l. Photography		111	115	65	291
Computer Programming		29			29
Computer Technology			34	60	94
Cosmetology	317	642	434	337	1,730
Costume Design. Ill. & Drop.		38	108	134	280
Dental Lab Process.		57	68	63	188
Dental Office Asst.		91	94	81	266
Drafting, Arch. & Mech. (Voc.)		160	58	28	246
Electrical Inst. & Prac.	3	1,271	785	553	2,612
Electro. Mech. Drafting		48	20	25	93
Equipment Repair		103	40	32	175
Fashion Design. Tech.			27		27
Fashion Design. Voc.			88	37	125
Fashion Merchandising		59	76	32	167
Fur Manufacturing		43	19	31	93
Graphic Communications		56		30	86
Health Asst.					
Health Careers	84	565			649
Health Occup. Sci.		3	116	80	199
Industrial Design			71	43	114
Interior Decoration		57	33	24	114
Jewelry Design & Mfg.		39	33	28	100
Machine Shop Practice	29	259	158	139	585
Maritime Occupations		203	113	70	386
Meat Merchandising		33	27	23	83
Mechanical Drawing		98	27	16	142
Medical Office Asst.		51	88	49	188
Men's Clothing Mfg.		35	14	8	57

Table V

REGISTER-FULL TIME VOCATIONAL STUDENTS
DISTRIBUTION BY GRADE AND COURSE

OCTOBER 15, 1976

COURSE	9th GRADE	10th GRADE	11th GRADE	12th GRADE	TOTAL
Optical Mechanics		60	36	13	112
Phys. & Tech. Asst.			117	155	272
Plumbing	14	134	93	79	320
Practical Nursing			236	163	399
Printing	13	588	415	407	1,423
Radio Elec. Mech.					
Radio T.V. Mech.		766	372	344	1,482
Sculp. & Stone Carving			63	21	84
Sheet Metal Work		66	21	24	111
Technical Courses	89	1,120	609	571	2,389
Textile Design & Weav.		20	23	11	54
Upholstery		33	26	23	82
Women's Apparel Mfg.		739	268	196	1,203
Woodworking (Gen.)	16	816	2	1	835
Acct. & Business Prac.		419	483	302	1,204
Clerical		29	167	177	373
Gen. Commercial	325	750	369	385	1,829
Distributive Ed.		170	261	141	572
Secretarial - Sten. - Typ.		1,603	1,177	756	3,536
Others	731	322	174	295	1,522
TOTALS	11,669	16,208	10,970	8,423	47,274

Sources: Addendum to Supplement the Comparative Analysis of the Organization of the High Schools for the Fall Term 1976

Table VI

Special Occupational Education Projects in the Bronx

School	Part Time-Full Time	# of Students	Handicap	Courses Offered
Bronx Occupational Center	F/T	250	CRMD	
Stevenson	P/T	21	brain injured	automotive, electrical and building maintainance, clerical
Kennedy*	P/T	17	brain injured	clerical, automotive
Kennedy*	F/T	25	brain injured	health careers
Gompers	P/T	12	brain injured	electrical installation
Morris	F/T	50	CRMD	clerical occupations

* zoned as a Manhattan School

Source: Division of Special Education and Pupil Personal Services
Office of Funded Programs for the Handicapped

Table VII

Exploratory and Occupational Course Offerings in the Bronx Academic/Comprehensive High Schools Spring, 1977

COURSE TITLE	No. Schools Offering Program	No. Periods/wk	Total Enrollments
Typing	12	5	5,904
Accounting/Bookkeeping	11	5	1,566
Stenography	10	5/10	1,198
Auto Mechanics/Transportation	8	5/10	999
Record Keeping	8	5	1,504
Home Nursing	7	5/10	706
Wood Shop (I.A.)	7	5	910
Child Care	5	5/10	364
Mechanical Drawing	5	5	282
Metal Shop (I.A.)	5	5	522
Photography	5	5	533
Clerical Practices	4	5/10	501
Business/Office Machines	4	5	607
Sewing	4	5/10	150
Ceramics/Plastics (I.A.)	3	5	254
Data Processing	3	5	570
Electrical Shop (I.A.)	3	5	250
Foods	3	5/10	138
Health Careers	3	5/10	207
Business Law	2	5	75
Career Art	2	5/10	174

Table VII (cont'd)

COURSE TITLE	No. Schools Offering Program	No. Periods/wk	Total Enrollments
Distributive Ed.	2	5	330
Home Repair	2	5	178
Introduction to Business	2	5	241
Jewelry	2	5	105
Medical Lab Ass't/Lab Tech.	2	5/10	70
Office Training	2	5	379
Practical Nursing	2	5	152
Stage	2	5	49
Advertising Skills Training	1	10	38
Animal Care	1	5	50
Animal Husbandry and Botanical Careers	1	5	241
Auxilary Police	1	5	62
Business Management	1	5	34
Business Skills	1	5	34
Child Development	1	5	51
Clothing	1	5	92
College Accounting	1	5	36
Construction	1	10	57
Cooking	1	5	53
Court Reporting	1	5/10	49
Dental Assistant	1	5/10	28
Emergency Medical Technician	1	5	36
Geriatrics	1	5	19
Graphics	1	10	19
Health Services	1	5	50

Table VII (cont'd)

COURSE TITLE	No. Schools Offering Program	No. Periods/wk	Total Enrollments
Heating & Air Conditioning	1	5	31
Lab Techniques	1	5	60
Machine Shop	1	5/10	92
Machine Transcription	1	5	29
Medical Assistant	1	10	25
Medical Office Practice	1	5	48
Medical Ward Clerk	1	5	34
Merchandising	1	5	60
Music & Art Careers	1	5	464
Nutrition	1	5	38
Office Lab (simulation)	1	5	65
Refrigeration	1	5	16
Retail Restaurant Management	1	10	22
Small Store Management	1	5	29
Technical Careers in Science	1	5	14
World of Work	1	5	62
		GRAND TOTAL	21,056

Table VIII

Career Offerings College Level Bronx	H. Lehman College	Fordham Rose Hill	Hostos Community College	Bronx Community College
HEALTH				
Dental Hygiene			X 40	
Medical Lab. Technology				X
Nursing	X		X 168	X
Radiologic Technology			X 109	
BUSINESS				
Accounting		X	X 100	
Accounting Advanced			X	
Business Administration			X	
Business Law		X		
Business Management		X	X	
Computer Management		X		
Economics		X		
Finance		X		
Marketing		X		
Secretarial Science			X	X
Executive Secretarial				X
Legal Secretarial				X
Medical Secretarial				X
Secretarial Assistant				X
School Secretarial				
TECHNOLOGY				
Chemical Technology				X
Electrical Technology				X
Mechanical Technology				X
Plastic Technology				X

Table IX

Number of Students Enrolled in the Shared Instructional Program in the Bronx (1975-76)

	Receiving Schools										
Sending Schools	Smith	Dodge	Addams	Gompers	Stevenson	Clinton	Childs	Manhattan Vocational	Norman Thomas	Art & Design	Total Sent
Stevenson	1	1									2
Columbus								7	11	4	22
Clinton	30	1		14	1						46
Childs	2	2				6					9 10
Monroe	1					1					2
Morris	12	2	4	10							28
Roosevelt	1	13				1					15
Walton		1									1
Taft		14		4		5					23
Satellite Academy	3	1		1							5
Auxiliary Services				1							1
Other	1		2	11		5	1				20
Total Received	51	34	6	41	1	18	1	7	11	4	174

Table X

SHARED INSTRUCTION COURSES TAKEN BY STUDENTS FROM BRONX H.S.'S

RECEIVING SCHOOL	COURSES OFFERED
Smith	Auto Mechanics
Dodge	Cosmetology
Addams	Cosmetology, Health Service, Fashion Art, Food Services, Data Processing, Office Practices
Gompers	Radio and T.V. Repair, Electrical Installation
Stevenson	Machine Shop
Clinton	Animal Care, Dog Grooming
*Manhattan Vocational	Machine Shop, Refrigeration, Air Conditioning and Applicance Repair
*Norman Thomas	Bilingual Secretarial, Data Processing, Computer Programming, Key Punch
*Art & Design	Commercial Photography, Commercial Art

*These Schools are in Manhattan

Table X (cont'd)

Program Centers and Courses Offered

The Bronx (FY 75-76)

Center	Courses
Grace Dodge	Bookkeeping & Key Punch Beginning Typing Intermediate Typing Advanced Typing Gregg Shorthand
Adlai Stevenson	Automotive Elementary Typing
Morris	Data Processing/Key Punch Beginning Typing Advanced Typing Retail Sales

ATTACHMENT D

DETAILED OCCUPATIONAL PROJECTIONS

This ATTACHMENT presents employment estimates, projected requirements, and average annual job openings in tabular form for 241 occupations, analyzed as part of the research underlying information of the Occupational Outlook Handbook..These data are classified into the 13 occupational clusters used to group Handbook occupations; industrial productionand related occupations; office occupations; service occupations; education and related occupations; sales occupations; construction occupations; occupations in transportation activities; scientific and technical occupations; social sciences; social service occupations; and art, design, and communications - related occupations.

When applicable, table 1 includes the program codes for related instructional programs for both vocational and higher education (Vocational Education Codes and Higher Education General Information Survey (HEGIS) Codes). This coding helps to bridge the gap between education and manpower data.

Table 1.* Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974-85

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974-85	Annual average openings. 1974-85		
						Total	Employment change	Replacement needs[3]
Industrial production and related occupations:								
Foundry occupations:								
Patternmakers	17.2302	......	20,500	21,200	3.4	500	50	450
	17.3699	.....	....	....	......	....	....	....
Molders	17.2301	......	60,000	62,000	3.3	1,300	200	1,100
Coremakers	17.2301	......	24,500	25,300	3.3	550	50	500
Machining occupations:								
All-round machinists	17.2302	......	335,000	414,000	23.6	14,500	7,200	7,300
Instrument makers (mechanical)	17.2302	......	5,500	6,000	5.2	150	50	100
Machine tool operators	17.2303	......	600,000	650,000	8.3	18,000	4,500	13,500
Setup workers (machine tools)	17.2302	......	50,000	55,000	5.2	1,350	250	1,100
Tool and die makers	17.2307	......	170,000	200,000	19.9	6,600	3,000	3,600
Printing occupations	17.1900	5009	....	....	......	....	....	....
Bookbinders and related workers	17.1906	......	35,000	38,000	9.1	1,900	300	1,600
Composing room occupations	17.1901	......	165,000	158,000	- 4.6	3,900	-700	4,600
Electrotypers and stereotypers	17.1903	......	4,000	3,200	-20.9	20	- 80	100
Lithographic occupations	17.1902	......	85,000	108,000	30.3	4,300	2,300	2,000
Photoengravers	17.1904	......	17,000	16,000	- 5.9	250	-100	350

See footnotes at end of table.

* Source: U.S. Department of Labor, Bureau of Labor Statistics . Bullitin 1606, Supplement 3,(Revised), 1975.

Table 1. Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974–85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974–85	Annual average openings, 1974–85		
						Total	Employment change	Replacement needs[3]
Industrial production and related occupations—Continued								
Printing occupations—Continued								
Printing press operators and assistants	17.1902	......	140,000	170,000	22.3	5,600	2,800	2,800
Other industrial production and related occupations:								
Assemblers	....	......	1,140,000	1,350,000	18.5	63,000	19,000	44,000
Automobile painters	17.0301	......	25,000	32,000	21.1	900	500	400
Blacksmiths	17.2399	......	9,000	6,100	−30.8	50	−250	300
Blue-collar worker supervisors	17.1700	......	1,460,000	1,770,000	21.0	61,000	28,000	33,000
Boilermaking occupations	17.1099	......	45,000	62,000	40.9	[illegible]	1,600	1,100
Boiler tenders	17.3200	......	90,000	86,000	− 4.4	[illegible]	−400	2,500
Electroplaters	17.2399	......	34,000	41,000	18.8	[illegible]	600	650
Forge shop occupations	17.2399	......	65,000	73,000	8.9	1,750	550	1,200
Furniture upholsterers	17.3500	......	34,000	35,500	7.6	1,200	200	1,000
Inspectors	17.2400	......	790,000	1,000,000	26.5	51,000	19,000	32,000
Millwrights	17.1099	......	95,000	115,000	21.0	3,800	1,800	2,000
Motion picture projectionists	....	......	18,000	19,500	8.5	1,000	150	850
Ophthalmic laboratory technicians	07.0601 17.2101	 5212	 22,000	 35,000	...... 59.1	 2,100	 1,300	 800
Photographic laboratory occupations	17.0900	5007	50,000	61,000	26.5	3,300	1,200	2,100
Power truck operators	17.100302	......	347,000	400,000	15.3	9,100	4,800	4,300
Production painters	....	......	125,000	151,000	19.1	5,000	2,200	2,800
Stationary engineers	17.3200	......	193,000	193,000	0.0	5,000	0	5,000
Wastewater treatment plant operators	17.3203	......	62,000	100,000	61.3	6,100	3,450	2,650
Welders	17.2306	5308	645,000	815,000	26.2	27,000	15,500	11,500
Office occupations	14.00	......	....	....	......	....	....	....
Clerical occupations:								
Bookkeeping workers	14.0102	......	1,700,000	1,875,000	10.9	121,000	17,000	104,000
Cashiers	14.0103	......	1,111,000	1,340,000	20.6	97,000	21,000	76,000
Collection workers	04.0800 14.9900	......	63,000	81,500	29.4	4,500	1,700	2,800
File clerks	14.0302	......	275,000	320,000	15.9	25,000	4,000	21,000
Hotel front office clerks	04.1100	......	54,000	63,000	17.3	4,250	850	3,400
Office machine operators	14.0104	5005	170,000	190,000	13.1	12,800	2,100	10,700
Postal clerks	14.0403	......	293,000	302,000	3.1	9,700	800	8,900
Receptionists	14.0406	......	460,000	635,000	38.3	57,500	16,000	41,500
Secretaries and stenographers	14.0700	5005	3,300,000	4,860,000	47.8	439,000	142,500	296,500
Shipping and receiving clerks	14.0503	......	465,000	560,000	20.4	20,500	8,700	11,800
Statistical clerks	14.0303	......	325,000	375,000	15.8	23,000	4,500	18,500
Stock clerks	14.0504	......	490,000	610,000	25.0	26,000	11,000	15,000
Typists	14.0900	5005	1,000,000	1,400,000	34.9	125,000	33,000	92,000
Computer and related occupations	14.0200	......	....	....	......	....	....	....
Computer operating personnel	14.0201 14.0202 14.020201	5102 5104	500,000	545,000	10.1	27,500	4,500	23,000 ....
Programmers	14.0203	0704 5103	200,000	285,000	42.5	13,000	7,800	5,200 ....
Systems analysts	14.0204	0705	115,000	190,000	65.2	9,100	7,000	2,100
Banking occupations:								
Bank clerks	14.0102 14.0104 14.0303 14.0399	....	517,000	718,000	38.9	54,000	18,000	36,000 ....

See footnotes at end of table.

Table 1. Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974-85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974-85	Annual average openings, 1974-85		
						Total	Employment change	Replacement needs[3]
Office occupations—Continued								
Banking occupations—Continued								
Bank officers	04.0400	0504	240,000	333,000	38.9	16,000	8,500	7,500
	....	5003	....	....	......	....	....	....
Bank tellers	14.0105	......	270,000	377,000	38.9	30,000	10,000	20.000
Insurance occupations	04.1300	0512	....	....	......	....	....	....
Actuaries	....	1703	10,700	14,400	34.1	700	350	350
Claim representatives	04.1300	......	125,000	152,000	21.8	6,600	2,500	4,100
Insurance agents, brokers and underwriters	04.1300	......	470,000	536,000	15.0	19,400	6,400	13,000
Administrative and related occupations:								
Accountants	....	0502	805,000	995,000	23.9	45,500	17,500	28,000
	....	5002	....	....	......	....	....	....
Buyers	04.0800	0509	110,000	150,000	37.6	9,000	4,000	5,000
	....	5004	....	....	......	....	....	....
City managers	....	2102	2,900	4,200	47.4	150	100	50
Credit managers	14.0899	0504	66,000	90,000	36.4	4,500	2,200	2,300
	....	5003	....	....	......	....	....	....
Hotel managers and assistants	04.1100	0508	120,000	150,000	22.8	6,500	2,500	4,000
	....	5010	....	....	......	....	....	....
Lawyers	....	1401	342,000	490,000	43.3	26,400	13,500	12,900
Personnel and labor relations workers	14.0602	......	320,000	450,000	40.2	23,000	12,000	11,000
	14.0603	0515	....	....	......	....	....	....
	14.0699	0516	....	....	......	....	....	....
Public relations workers	04.0100	......	100,000	134,000	28.8	6,500	2,300	4,000
Purchasing agents	04.0800	0509	189,000	258,000	36.5	11,700	6,300	5,400
	....	5004	....	....	......	....	....	....
Urban planners	....	0206	13,000	18,000	38.5	700	450	250
Service occupations:								
Cleaning and related occupations:								
Building custodians	17.1100	......	1,900,000	2,400,000	26.6	146,000	47,000	99,000
Hotel housekeepers and assistants	09.0205	......	18,000	21,000	15.6	1,450	250	1,200
Pest controllers	....	......	27,000	36,500	32.1	2,100	800	1,300
Food service occupations	17.2900	......	....	....	......	....	....	....
Bartenders	....	......	233,000	300,000	28.8	15,200	6,100	9.100
Cooks and chefs	17.2902	......	955,000	1,250,000	30.9	78,600	26,800	51,800
Dining room attendants and dishwashers	....	......	370,000	435,000	17.6	17,200	6,800	10.400
Food counter workers	17.2904	......	350,000	425,000	21.4	29,200	6,700	22,500
Meatcutters	17.2903	......	202,000	204,000	0.9	5,000	200	4.800
Waiters and waitresses	17.2904	......	1,180,000	1,440,000	21.8	105,000	24,000	81,000
Personal service occupations:								
Barbers	17.2601	5006	130,000	135,000	3.6	5,550	450	5,100
Bellhops and bell captains	04.1100	......	17,000	19,000	9.6	600	150	450
Cosmetologists	17.2602	5006	500,000	622,000	24.9	50,800	11,300	39.500
Funeral directors and embalmers	07.0909	......	45,000	45,000	0.0	1,400	0	1,400
Private household service occupations:								
Private household workers	09.0201	......	1,200,000	900,000	−26.7	52,000	−30,000	82.000
	09.0202	......	....	....	......	....	....	....
	09.0203	......	....	....	......	....	....	....
	09.0205	......	....	....	......	....	....	....

See footnotes at end of table.

Table 1. Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974–85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974–85	Annual average openings, 1974–85		
						Total	Employment change	Replacement needs[3]
Service occupations—Continued								
Protective and related service occupations:								
Firefighters	17.2801	5507	220,000	270,000	23.3	7,300	4,600	2,700
Guards	17.2802	......	475,000	508,000	7.4	26,000	3,000	23,000
Police officers	17.2802	2105	480,000	650,000	35.5	22,000	15,500	6,500
	....	2209	....	....	......	....	....	....
	....	5505	....	....	......	....	....	....
State police officers	17.2802	2105	45,500	76,000	68.3	3,600	2,850	750
	....	2209	....	....	......	....	....	....
	....	5505	....	....	......	....	....	....
Construction inspectors (government)	17.2899	......	22,000	30,000	43.0	1,700	750	950
Health and regulatory inspectors (government)	17.2899	5408	110,000	160,000	44.0	7,900	4,500	3,400
Occupational safety and health workers	16.0602	......	25,000	32,500	29.0	1,100	700	400
	17.2801	......	....	....	......	....	....	....
	17.2899	......	....	....	......	....	....	....
Other service occupations:								
Mail carriers	14.0403	......	267,000	275,000	3.0	5,600	700	4,900
Telephone operators	14.0401	......	390,000	385,000	− 1.3	28,000	− 500	28,500
Education and related occupations:								
Teaching occupations:								
Kindergarten and elementary school teachers	....	0802	1,276,000	1,439,000	12.8	94,000	15,000	79,000
Secondary school teachers	....	0803	1,086,000	998,000	− 8.1	37,500	−4,000	41,500
College and university teachers	....	0805	527,000	516,000	− 2.1	14,000	−1,000	15,000
Library occupations:								
Librarians	....	1601	125,000	150,000	20.0	10,700	2,300	8,400
Library technicians and assistants	14.0499	5504	135,000	175,000	29.3	14,100	3,600	10,500
Sales occupations:	04.0000	......	....	....	......	....	....	....
Automobile parts counter workers	04.0300	0509	75,000	96,000	27.5	3,500	1,900	1,600
	....	5004	....	....	......	....	....	....
Automobile salesworkers	04.0300	0509	130,000	160,000	25.5	5,500	2,900	2,600
	....	5004	....	....	......	....	....	....
Automobile service advisors	04.0300	0509	20,000	28,000	21.3	800	450	350
	....	5004	....	....	......	....	....	....
Gasoline service station attendants	04.1600	......	450,000	525,000	16.3	12,700	6,700	6,000
Manufacturers' salesworkers	04.1200	0509	380,000	387,000	2.4	9,500	800	8,700
	....	5004	....	....	......	....	....	....
Real estate salesworkers and brokers	04.1700	0511	400,000	480,000	21.8	28,500	7,800	20,700
	....	5004	....	....	......	....	....	....
Retail trade salesworkers	04.0800	0509	2,800,000	3,175,000	15.1	190,000	38,000	152,000
	....	5004	....	....	......	....	....	....
Route drivers	....	......	190,000	200,000	4.1	3,700	700	3,000
Securities salesworkers	04.0400	0505	100,000	130,000	31.9	6,100	2,900	3,200
	....	5004	....	....	......	....	....	....
Wholesale trade salesworkers	04.0800	0509	770,000	883,000	15.0	30,000	10,000	20,000
	....	5004	....	....	......	....	....	....
Construction occupations:	....	5317	....	....	......	....	....	....
Asbestos and insulation workers	17.1099	......	30,000	50,000	66.7	2,300	1,800	500

See footnotes at end of table.

Table [illegible] Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974-85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974-85	Annual average openings, 1974-85		
						Total	Employment change	Replacement needs[3]
Construction occupations—Continued								
Bricklayers and stonemasons	17.1004	......	165,000	205,000	24.2	6,500	3,600	2,900
Carpenters	17.1001	......	1,060,000	1,300,000	22.5	49,100	21,700	27,400
Cement masons (cement and concrete finishers)	17.1099	......	90,000	120,000	33.3	4,300	2,700	1,600
Construction laborers	17.1099	......	865,000	1,004,000	16.1	28,400	12,600	15,800
Drywall installers and finishers	17.1008	......	60,000	75,000	25.0	1,900	1,400	500
Electricians (construction)	17.1002	......	245,000	320,000	30.6	11,700	6,800	4,900
Elevator constructors	17.1099	......	19,000	25,000	31.6	1,050	550	500
Floor covering installers	17.1099	......	85,000	100,000	17.6	2,400	1,400	1,000
Glaziers	17.1099	......	9,000	13,000	44.4	500	350	150
Lathers	17.1006	......	25,000	25,000	0.0	200	0	200
Operating engineers (construction machinery operators)	17.100302	......	400,000	610,000	51.4	27,000	18,800	8,200
Painters and paperhangers:								
Painters	17.1005	......	450,000	500,000	10.1	16,700	4,200	12,500
Paperhangers	....	......	20,000	25,000	25.0	1,400	500	900
Plasterers	17.1006	......	26,000	25,000	− 3.8	450	−100	550
Plumbers and pipefitters	17.1007	......	375,000	535,000	42.7	23,500	14,600	8,900
Roofers	17.1010	......	90,000	130,000	44.4	5,000	3,600	1,400
Sheet-metal workers	17.2305	......	65,000	75,000	15.4	2,000	900	1,100
Structural, ornamental, and reinforcing iron workers, riggers, and machine movers	17.1099	......	85,000	112,000	31.8	3,900	2,500	1,400
Occupations in transportation activities:								
Air transportation occupations:	17.0400	......	....	....	......	....	....	....
Air traffic controllers	17.0403	......	22,000	27.500	24.8	750	500	250
Airplane mechanics	17.0401	......	130,000	145,000	12.1	3,200	1,400	1,800
Airplane pilots	16.0601	......	79,000	101,000	28.7	2,800	2,100	700
Flight attendants	04.1900	5006	41,000	56,000	35.2	6,400	1,300	5,100
Reservation, ticket, and passenger agents	04.1900	......	56,000	76,000	35.8	4,250	1,800	2,450
Merchant marine occupations:								
Merchant marine officers	17.0802	......	7,500	7,500	0.0	150	0	150
Merchant marine sailors	17.0801	......	20,000	17,150	−14.2	50	− 250	300
Railroad occupations:								
Brake operators	....	......	73,000	69,000	− 5.8	700	− 400	1,100
Conductors	....	......	39,500	41,000	4.6	1,250	150	1,100
Locomotive engineers	....	......	37,000	38,500	4.3	1,350	150	1.200
Shop trades	....	......	75,000	57,000	−27.0	−300	−1,900	1,600
Signal department workers	17.1402	......	11.500	11.200	− 2.6	250	− 50	300
Station agents	04.1900	......	7,600	3,700	−51.0	−200	−350	150
	14.0103	......	....	....	......	....	....	....
Telegraphers, telephoners, and tower operators	14.0401	......	11.000	6,600	−39.0	−150	− 400	250
Track workers	....	......	57,000	55,000	− 2.9	1,050	− 150	1,200
Driving occupations:								
Intercity busdrivers	04.1900	......	25.000	26,000	3.9	850	100	750
Local transit busdrivers	04.1900	......	71.000	78,500	10.4	2,900	700	2.200
Local truck drivers	....	......	1,600,000	1,760.000	8.5	38,500	12,500	26,000
Long distance truck drivers	....	......	540.000	585.000	8.1	12,000	4,000	8.000
Parking attendants	04.0300	......	42,000	45.000	7.0	1,800	300	1,500
Taxicab drivers	04.1900	......	92,000	89,000	− 3.7	2,450	− 300	2,750

See footnotes at end of table.

Table 1. Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974-85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974-85	Annual average openings, 1974-85		
						Total	Employment change	Replacement needs[3]
Scientific and technical occupations:								
Conservation occupations:								
Foresters	01.0700	0114	24,000	29,000	20.5	950	450	500
Forestry technicians	01.0601	5403	10,500	13,800	32.1	500	300	200
Range managers	01.0608	0117	2,500	3,850	53.9	150	100	50
Engineers:	....	0900	[4]1,100,000	[4]1,500,000	32.8	[4]52,500	[4]33,500	[4]19,000
Aerospace	....	0902	52,000	58,300	12.1	1,100	550	550
Agricultural	....	0903	12,000	15,900	32.5	550	350	200
Biomedical	....	0905	3,000	4,000	33.3	150	100	50
Ceramic	....	0916	12,000	15,900	32.5	550	350	200
Chemical	....	0906	50,000	62,800	25.6	1,850	1,200	650
Civil	....	0908	170,000	228,100	36.6	9,300	5,600	3,700
Electrical	....	0909	290,000	378,900	32.0	12,200	8,400	3,800
Industrial	....	0913	180,000	227,100	26.2	7,200	4,300	2,900
Mechanical	....	0910	185,000	237,000	29.5	7,900	4,900	3,000
Metallurgical	....	0914	17,000	20,000	21.2	550	300	250
Mining	....	0918	5,000	7,100	42.0	350	200	150
Petroleum	....	0907	12,000	18,200	51.7	750	550	200
Environmental scientists:								
Geologists	....	1914	23,000	32,000	39.4	1,300	800	500
Geophysicists	....	1916	8,200	11,400	39.4	450	300	150
Meteorologists	....	1913	5,600	6,900	23.3	200	100	100
Oceanographers	....	1919	2,500	3,100	22.5	100	50	50
Life science occupations:								
Life scientists	....	0400	190,000	245,000	29.0	10,700	5,400	5,300
Mathematics occupations:								
Mathematicians	....	1701	40,000	46,100	16.5	1,550	600	950
Statisticians	....	1702	24,000	31,000	32.6	1,450	650	800
Physical scientists:								
Astronomers	....	1911	2,000	2,100	4.0	30	10	20
Chemists	....	1905	135,000	173,000	28.6	6,400	3,500	2,900
Physicists	....	1902	48,000	59,400	25.0	1,700	1,100	600
Other scientific and technical occupations:								
Broadcast technicians	16.0108	5008	22,000	26,000	18.2	1,350	350	1,000
Drafters	17.1300	5304	313,000	444,000	41.7	17,300	12,000	5,300
Engineering and science technicians	16.0100	5300	560,000	794,000	41.4	32,000	21,000	11,000
	....	5401	....	....	......	....	....	....
	....	5407	....	....	......	....	....	....
Surveyors	....	5309	55,000	86,600	59.2	3,600	2,700	900
Mechanics and repairers:								
Telephone craft occupations:								
Central office craft occupations	17.1501	......	110,000	130,000	18.2	2,900	1,800	1,100
Central office equipment installers	17.1501	......	30,000	36,000	18.0	800	500	300
Line installers and cable splicers	17.1402	......	55,000	53,500	– 3.6	150	–200	350
Telephone and PBX installers and repairers	17.1501	......	115,000	130,000	12.1	2,400	1,300	1,100

See footnotes at end of table.

Table 1. Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974–85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974–85	Annual average openings, 1974–85		
						Total	Employment change	Replacement needs[3]
Mechanics and repairers—Continued								
Other mechanics and repairers:								
Air-conditioning, refrigeration, and heating mechanics	17.0100	5317	200,000	285,000	33.6	10,900	7,000	3,900
Appliance repairers	17.0200	5310	135,000	170,000	24.1	5,600	3,000	2,600
Automobile body repairers	17.0301	......	145,000	176,000	21.4	4,700	2,800	1,900
Automobile mechanics	17.0302	5306	735,000	875,000	19.3	24,400	12,900	11,500
Boat motor mechanics	17.2200	......	11,000	14,000	29.0	550	300	250
Bowling pin-machine mechanics	17.1401	......	5,000	5,600	7.7	150	50	100
Business machine repairers	17.0600	5310	65,000	97,000	49.8	3,100	2,900	200
Computer service technicians	16.0108	5105	50,000	93,000	86.0	4,300	3,900	400
Diesel mechanics	17.1200	5307	95,000	125,000	29.5	3,400	1,700	1,700
Electric sign repairers	17.1002	......	9,000	12,000	29.4	450	250	200
Farm equipment mechanics	01.0301	......	60,000	75,000	25.0	2,700	1,300	1,400
Industrial machinery repairers	17.10031	......	500,000	840,000	65.8	42,500	30,500	12,000
Instrument repairers	17.2101	5314	110,000	154,000	40.0	6,600	4,000	2,600
Jewelers	....	......	18,000	18,600	2.8	750	50	700
Locksmiths	....	......	9,000	11,000	27.3	400	200	200
Maintenance electricians	17.1400	......	280,000	370,000	32.1	13,800	8,200	5,600
Piano and organ tuners and repairers	....	......	8,000	8,000	0.0	350	0	350
Shoe repairers	17.3402	......	30,000	26,800	−10.5	1,300	− 300	1,600
Television and radio service technicians	17.1503	5310	135,000	180,000	26.9	6,600	4,200	2,400
Truck mechanics and bus mechanics	....	5306	135,000	173,000	27.9	5,600	3,400	2,200
Vending machine mechanics	....	......	24,000	25,000	4.2	600	100	500
Watch repairers	17.2102	......	17,000	17,700	5.6	800	100	700
Health occupations:								
Dental occupations:								
Dentists	....	1204	105,000	145,000	34.9	6,200	3,400	2,800
Dental assistants	07.0101	5202	120,000	155,000	32.5	14,500	3,500	11,000
Dental hygienists	07.0102	5203	23,000	58,000	156.7	6,300	3,200	3,100
Dental laboratory technicians	07.0103	5204	32,000	47,500	47.8	2,600	1,400	1,200
Medical practitioners:								
Chiropractors	....	1221	18,000	22,500	25.6	1,200	400	800
Optometrists	....	1209	19,000	23,500	22.8	900	400	500
Physicians and osteopathic physicians	....	1206	350,000	520,000	49.3	23,000	15,600	7,400
	....	121[illegible]	....	....	......	....	....	....
Podiatrists	....	12[illegible]6	7,500	8,700	15.8	400	100	300
Veterinarians	....	1218	29,000	38,500	33.0	1,450	850	600
Medical technologist, technician, and assistant occupations:								
Electrocardiograph technicians	07.0902	5217	11,000	15,000	39.0	1,000	400	600
Electroencephalographic technicians	07.0901	5217	3,800	5,500	44.7	350	150	200
Medical laboratory workers	07.0200	1223	175,000	250,000	42.9	18,800	6,800	12,000
	07.0203	5205	....	....	......	....	....	....
	07.0299	......	....	....	......	....	....	....
Medical record technicians and clerks	14.0499	5213	53,000	120,000	121.7	11,500	5,900	5,600
Operating room technicians	07.0305	5211	28,000	41,000	43.7	2,700	1,100	1,600
Optometric assistants	07.0603	5212	11,500	19,000	63.8	1,800	700	1,100
Radiologic (X-ray) technologists	07.0501	5207	82,000	112,000	36.5	8,600	2,700	5,900
Respiratory therapy workers	07.0903	5215	38,000	80,000	110.5	6,800	3,800	3,000
Nursing occupations:								
Registered nurses	07.0301	1203	860,000	1,290,000	50.0	71,000	39,000	32,000
	16.0305	5208	....	....	......	....	....	....

See footnotes at end of table.

Table 1. Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974–85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974–85	Annual average openings, 1974–85		
						Total	Employment change	Replacement needs[3]
Health occupations—Continued								
Nursing occupations—Continued								
Licensed practical nurses	07.0302	5209	495,000	965,000	95.0	93,000	43,000	50,000
Nursing aides, orderlies, and attendants	07.0303	......	970,000	1,500,000	54.6	123,000	48,000	75,000
Therapy and rehabilitation occupations:								
Occupational therapists	....	1208	9,400	13,800	46.5	1,000	400	600
Occupational therapy assistants	07.0401	5210	7,900	14,300	81.4	1,150	600	550
Physical therapists	....	1212	20,000	32,000	60.0	2,400	1,100	1,300
Physical therapist assistants and aides	07.0402	5219	10,500	18,000	71.4	1,400	650	750
Speech pathologists and audiologists	....	1220	31,000	51,000	63.0	3,700	1,800	1,900
Other health occupations:								
Dietitians	....	1306	33,000	42,500	29.4	3,200	900	2,300
Dispensing opticians	07.0601	5212	17,000	27,000	58.8	1,550	900	650
	17.2101	......	....	....	......	....	....	....
Health services administrators	....	1202	150,000	250,000	66.7	17,400	9,100	8,300
Medical record administrators	....	1202	12,000	14,500	27.6	1,100	300	800
Pharmacists	....	1211	117,000	137,000	17.4	6,500	1,900	4,600
Social scientists:								
Anthropologists	....	2202	3,800	5,400	42.9	250	150	100
	....	2203	....	....	......	....	....	....
Economists	....	2204	71,000	104,000	45.9	4,700	3,000	1,700
Geographers	....	2206	9,000	13,000	42.8	650	350	300
Historians	....	2205	26,000	32,000	19.8	1,300	500	800
Political scientists	....	2207	11,500	14,500	27.5	600	300	300
Psychologists	....	2000	75,000	105,000	40.7	5,200	2,800	2,400
Sociologists	....	2208	14,000	18,000	28.7	750	350	400
Social service occupations:								
Counseling occupations:								
School counselors	....	0826	44,000	48,000	8.9	2,050	350	1,700
Employment counselors	....	......	7,000	10,800	54.2	650	350	300
Rehabilitation counselors	....	......	19,000	29,000	52.6	2,100	900	1,200
College career planning and placement counselors	14.0602	0826	4,100	5,000	22.0	250	100	150
Other social service occupations:								
Recreation workers	04.1800	2103	65,000	96,000	42.6	5,900	2,700	3,200
	....	5506	....	....	......	....	....	....
Social service aides	....	5506	70,000	115,000	60.9	8,400	3,900	4,500
Social workers	....	2104	300,000	435,000	45.7	30,500	12,500	18,000
Art, design, and communications-related occupations:								
Design occupations:								
Architects	....	0202	40,000	60,000	52.3	3,000	1,900	1,100
Commercial artists	17.0700	1009	64,000	80,000	24.3	4,000	1,400	2,600
Display workers	04.0100	......	34,000	40,000	17.6	2,200	500	1,700
	17.0702	......	....	....	.....	....	....	....
Industrial designers	17.0703	......	10,000	11,500	15.0	450	150	300
Interior designers	17.0701	0203	34,000	40,000	18.0	1,550	550	1,000
Landscape architects	....	0204	12,000	18,000	52.3	900	600	300
Photographers	....	1011	80,000	95,000	19.2	3,400	1,400	2,000

See footnotes at end of table.

Table 1. Estimated 1974 employment, projected 1985 requirements, and average annual openings, by occupation, 1974–85—Continued

Occupation	Vocational education code[1]	Hegis code[2]	Estimated employment 1974	Projected requirements 1985	Percent change 1974–85	Annual average openings, 1974–85		
						Total	Employment change	Replacement needs[3]
Art, design, and communications-related occupations—Continued								
Communications-related occupations:								
Newspaper reporters	....	0602	40,000	45,500	13.7	2,200	500	1,700
Radio and television announcers	....	0603	19,000	23,000	21.1	600	350	250
Technical writers	....	......	20,000	26,000	24.9	1,150	450	700

---

[1] Vocational education codes are from *Vocational Education and Occupations* (U.S. Department of Health, Education, and Welfare, and U.S. Department of Labor, 1969).

[2] HEGIS codes are from the Higher Education General Information Survey. See *A Taxonomy of Instructional Programs in Higher Education* (U.S. Department of Health, Education, and Welfare, 1970).

[3] Replacement needs include openings arising from deaths, retirements, and other separations from the labor force. Does not include transfers to other occupations.

[4] Totals do not equal the sum of the individual estimates because all branches of engineering are not covered separately.

NOTE: Percentages were calculated using unrounded numbers and therefore may not agree with rounded numbers on employment and projected requirements shown in the table.

LABOR RESEARCH REPORT
1975-No. 11, July 1975

ATTACHMENT E

MANPOWER PROJECTIONS
New York City, 1970-1980

STATE OF NEW YORK
Hugh L. Carey, Governor

DEPARTMENT OF LABOR
Louis L. Levine, Industrial Commissioner

Table A. PROJECTED AVERAGE ANNUAL JOB OPENINGS AND INTERPOLATED 1976 EMPLOYMENT, NEW YORK CITY

Occupation	Interpolated 1976 employment (a)	Total job openings (b)		Openings due to growth (c)	Openings due to labor-force separations (d)
		Number	Percent of employment		
All occupations	3,630,230	121,511	3.3	-31,337	152,848
Professional, technical and kindred workers	639,495	28,605	4.5	4,304	24,301
Engineers, technical	31,912	274	0.9	-278	552
Engineers, aero-astronautic	837	-7	-0.8	-17	10
Engineers, chemical	940	-11	-1.2	-24	13
Engineers, civil	6,735	125	1.9	-28	153
Engineers, electrical	7,797	57	0.7	-39	96
Engineers, industrial	3,970	40	1.0	-28	68
Engineers, mechanical	4,198	-24	-0.6	-95	71
Engineers, metallurgical	167	1	0.6	-2	3
Engineers, mining	19	1	5.3	0	1
Engineers, petroleum	48	1	2.1	0	1
Engineers, sales	1,151	-6	-0.5	-28	22
Engineers, other	6,050	97	1.6	-17	114
Life and physical scientists	6,148	115	1.9	-28	143
Agricultural scientists	69	0	0	-2	2
Atmospheric, space scientists	112	3	2.7	0	3
Biological scientists	1,185	38	3.2	-2	40
Chemists	4,206	70	1.7	-20	90
Geologists	83	0	0	-1	1
Marine scientists	31	1	3.2	0	1
Physicists and astronomers	434	3	0.7	-2	5
Life, physical scientists, n.e.c.	28	0	0	-1	1
Mathematical specialists	3,365	129	3.8	1	128
Actuaries	802	32	4.0	6	26
Mathematicians	232	4	1.7	0	4
Statisticians	2,331	93	4.0	-5	98
Engineering, science technicians	24,255	413	1.7	-6	419
Agricultural, bio technicians (exc. health)	517	12	2.3	-6	18

continued

See footnotes at end of table.

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Chemical technicians	1,063	6	0.6	-19	25
Draftsmen	10,860	51	0.5	-133	184
Electrical, electronic technicians	5,582	78	1.4	13	65
Industrial engineering technicians	286	-5	-1.7	-10	5
Mechanical engineering technicians	146	-1	-0.7	-3	2
Surveyors	833	7	0.8	-6	13
Engineering, science technicians, n.e.c.	4,968	265	5.3	158	107
Medical workers, exc. technicians	104,127	6,352	6.1	978	5,374
Chiropractors	456	14	3.1	-6	20
Dentists	6,291	240	3.8	-36	276
Dietitians	2,977	201	6.8	31	170
Optometrists	569	19	3.3	-5	24
Pharmacists	5,468	179	3.3	-78	257
Physicians (incl. MD osteopaths)	28,471	1,422	5.0	250	1,172
Podiatrists	577	20	3.5	2	18
Registered nurses	52,979	3,743	7.1	598	3,145
Therapists	5,558	454	8.2	192	262
Veterinarians	441	24	5.4	12	12
Other medical and health	340	36	10.6	18	18
Health technol and technicians	19,369	1,541	8.0	616	925
Clinical lab technol, technicians	9,248	743	8.0	301	442
Dental hygienists	1,170	134	11.5	45	89
Health record technol, technicians	1,030	116	11.3	58	58
Radiology technol, technicians	3,431	204	6.0	57	147
Therapy assistants	223	15	6.7	8	7
Other health technol, technicians	4,267	329	7.7	147	182
Technicians, exc. health	4,046	139	3.4	64	75
Airplane pilots	638	7	1.1	1	6
Air traffic controllers	444	3	0.7	0	3
Embalmers	109	-1	-0.9	-7	6
Flight engineers	114	2	1.8	0	2
Radio operators	759	9	1.2	-5	14

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Other technicians, exc. health	1,982	119	6.0	75	44
Computer specialists	19,924	715	3.6	304	411
Computer programmers	13,504	452	3.3	134	318
Computer systems analysts	5,610	230	4.1	149	81
Other computer specialists	810	33	4.1	21	12
Social scientists	11,629	565	4.9	295	270
Economists	6,938	235	3.4	98	137
Political scientists	91	4	4.4	1	3
Psychologists	3,590	261	7.3	162	99
Sociologists	157	9	5.7	2	7
Urban and regional planners	665	38	5.7	23	15
Other social scientists	188	18	9.6	9	9
Teachers	135,758	6,970	5.1	840	6,130
Adult education	2,221	94	4.2	13	81
Elementary school	56,486	3,448	6.1	295	3,153
Preschool, kindergarten	5,010	357	7.1	71	286
Secondary school	40,075	1,317	3.3	-122	1,439
Teachers, n.e.c., exc. college and university	9,048	610	6.7	151	459
Teachers, college and university	22,918	1,144	5.0	432	712
Biology	697	38	5.5	16	22
Chemistry	478	7	1.5	-3	10
Economics	336	12	3.6	5	7
Engineering	380	7	1.8	-1	8
English	2,074	78	3.8	9	69
History	643	16	2.5	-1	17
Mathematics	1,129	50	4.4	20	30
Physics	457	3	0.7	-5	8
Other	16,724	933	5.6	392	541

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Writers, artists, entertainers	93,439	2,947	3.2	-302	3,249
Actors	3,904	116	3.0	-16	132
Athletes and kindred workers	1,693	72	4.3	23	49
Authors	4,618	152	3.3	-26	178
Dancers	899	29	3.2	-24	53
Designers	17,308	419	2.4	-176	595
Editors and reporters	21,165	796	3.8	-28	824
Musicians and composers	8,501	200	2.4	-77	277
Painters and sculptors	14,078	408	2.9	-93	501
Photographers	5,619	76	1.4	-57	133
Public relations men, writers	8,173	344	4.2	51	293
Radio, TV announcers	415	7	1.7	-1	8
Writers, artists, entertainers, n.e.c. ..	7,066	328	4.6	122	206
Other professional, technical	185,523	8,445	4.6	1,820	6,625
Accountants	55,539	1,545	2.8	-182	1,727
Architects	4,212	123	2.9	9	114
Archivists and curators	707	27	3.8	2	25
Clergymen	8,802	386	4.4	89	297
Religious, exc. clergymen	2,116	158	7.5	40	118
Farm management advisors	0	0	0	0	0
Foresters, conservationists	66	2	3.0	0	2
Home management advisors	276	9	3.3	-8	17
Lawyers and judges	28,290	1,328	4.7	188	1,140
Librarians	5,397	332	6.2	48	284
Operations, systems research	5,001	216	4.3	133	83
Personnel, labor relations	22,153	947	4.3	213	734
Research workers, n.e.c	11,721	731	6.2	341	390
Recreation workers	3,974	258	6.5	101	157
Social workers	31,337	1,953	6.2	610	1,343
Vocational, education counselors	5,932	430	7.2	236	194

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor force separations
		Number	Percent of employment		
Sales workers	277,658	8,088	2.9	-3,547	11,635
Advertising agents, salesmen	5,912	229	3.9	54	175
Auctioneers	204	6	2.9	-5	11
Demonstrators	812	21	2.6	-21	42
Hucksters and peddlers	3,155	57	1.8	-89	146
Insurance agents, brokers, etc.	20,190	404	2.0	-193	597
Newsboys	1,268	-74	-5.8	-104	30
Real estate agents, brokers	10,717	486	4.5	-71	557
Stock and bond salesmen	19,215	621	3.2	31	590
Sales reps, mfg	26,772	38	0.1	-815	853
Sales reps, wholesale trade	49,844	671	1.4	-974	1,645
Sales clerks, retail trade	111,044	4,668	4.2	-1,274	5,942
Salesmen, retail trade	13,607	358	2.6	-93	451
Salesmen, service and construction	14,918	603	4.0	7	596
Clerical workers	962,022	50,738	5.3	-3,450	54,188
Stenographers, typists, secretaries	325,531	24,002	7.4	1,128	22,874
Secretaries, legal	8,487	768	9.0	173	595
Secretaries, medical	4,491	360	8.0	54	306
Secretaries, other	213,412	16,619	7.8	1,532	15,087
Stenographers	6,886	217	3.2	-295	512
Typists	92,255	6,038	6.5	-336	6,374
Office machine operators	45,887	1,568	3.4	-636	2,204
Bookkeeping billing operators	5,335	237	4.4	-67	304
Calculating machine operators	3,509	95	2.7	-120	215
Computer, peripheral equipment	12,066	560	4.6	327	233
Duplicating machine operators	2,140	91	4.3	6	85
Keypunch operators	19,208	450	2.3	-748	1,198
Tabulating machine operators	558	-44	-7.9	-61	17
Other office machine operators	3,071	179	5.8	27	152

continued

Table A (continued)

Occupation	1976	Total job openings: Number	Total job openings: Percent of employment	Openings due to growth	Openings due to labor-force separations
Managers, officials, proprietors	325,271	9,679	3.0	-1,067	10,746
Buyers, sales, loan managers	73,266	2,011	2.7	-260	2,271
Bank, financial managers	23,887	934	3.9	285	649
Creditmen	3,360	53	1.6	-49	102
Buyers, shippers, farm products	229	2	0.9	-9	11
Buyers, wholesale, retail	18,658	634	3.4	-170	804
Purchasing agents, buyers, n.e.c.	7,471	141	1.9	-76	217
Sales managers, retail trade	7,976	190	2.4	-30	220
Sales managers, exc. retail trade	11,685	57	0.5	-211	268
Administrators, public inspectors	28,690	1,314	4.6	278	1,036
Assessors, controllers, local public administrators	407	27	6.6	0	27
Construction inspectors, public	820	39	4.8	8	31
Health administrators	5,200	357	6.9	140	217
Inspectors, exc. construction, public	4,740	167	3.5	23	144
Officials, administrators, public	9,344	279	3.0	-67	346
Postmasters and mail supervisors	272	10	3.7	-3	13
School administrators, college	1,822	134	7.4	72	62
School administrators, elementary, secondary	6,085	301	5.0	105	196
Other managers, officials, proprietors	223,315	6,354	2.8	-1,085	7,439
Funeral directors	961	9	0.9	-24	33
Managers, superintendents, bldg.	12,880	878	6.8	248	630
Office managers, n.e.c.	15,041	715	4.8	128	587
Officers, pilots, pursers, ship	1,362	-30	-2.2	-64	34
Officials of lodges, societies, unions	4,296	250	5.8	67	183
Railroad conductors	972	-2	-0.2	-29	27
Restaurant, cafe, bar managers	13,555	-48	-0.4	-487	439
Other managers, administrators	174,248	4,582	2.6	-924	5,506

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Craftsmen, foremen, and kindred workers	363,943	3,018	0.8	-6,054	9,072
Construction craftsmen	89,490	1,015	1.1	-1,190	2,205
Carpenters	21,608	158	0.7	-368	526
Carpenter apprentices	66	-1	-1.5	-1	0
Brickmasons and stonemasons	4,865	26	0.5	-78	104
Brick, stonemason apprentices	67	-2	-3.0	-3	1
Bulldozer operators	626	-2	-0.3	-13	11
Cement and concrete finishers	2,151	38	1.8	1	37
Electricians	17,583	314	1.8	-75	389
Electrician apprentices	1,114	3	0.3	-3	6
Excavating, grading, machine operators	1,802	2	0.1	-31	33
Floor layers, exc. tilesetters	1,072	9	0.8	-16	25
Painters, construction, maintenance	16,837	176	1.0	-364	540
Painter apprentices	31	0	0	-1	1
Paperhangers	457	19	4.2	0	19
Plasterers	1,355	15	1.1	-30	45
Plasterer apprentices	9	1	11.1	0	1
Plumbers and pipefitters	14,276	222	1.6	-144	366
Plumber and pipefitter apprentices	368	-2	-0.5	-4	2
Roofers and slaters	1,797	33	1.8	3	30
Structural metal craftsmen	2,510	10	0.4	-39	49
Tilesetters	896	-4	-0.5	-24	20
Foremen, n.e.c.	60,926	865	1.4	-718	1,583
Metalworking craftsmen, exc. mechanics	18,891	-316	-1.7	-770	454
Blacksmiths	221	4	1.8	-5	9
Boilermakers	1,343	-6	-0.5	-38	32
Heat treaters, annealers, etc.	82	-3	-3.7	-5	2
Forgemen and hammermen	216	-2	-0.9	-7	5
Job and die setters, metal	1,108	-15	-1.4	-38	23
Machinists	7,890	-108	-1.4	-308	200
Machinist apprentices	42	-2	-4.8	-2	0
Millwrights	273	-3	-1.1	-9	6
Molders, metal	494	-17	-3.4	-27	10

continued

Table A (continued)

Occupation	1976	Total job openings: Number	Total job openings: Percent of employment	Openings due to growth	Openings due to labor-force separations
Other clerical workers	590,604	25,168	4.3	-3,942	29,110
Bank tellers	19,999	1,247	6.2	131	1,116
Billing clerks	8,989	594	6.6	73	521
Bookkeepers	113,132	4,903	4.3	-1,545	6,448
Cashiers	36,336	1,819	5.0	-307	2,126
Clerical assistants, social welfare	113	11	9.7	3	8
Clerical supervisors, n.e.c.	10,027	419	4.2	13	406
Collectors, bill and account	2,960	119	4.0	-8	127
Counter clerks, except food	14,264	639	4.5	-58	697
Dispatchers, starters, vehicle	4,954	168	3.4	28	140
Enumerators and interviewers	2,634	23	0.9	-100	123
Estimators, investigators, n.e.c.	18,873	689	3.7	-89	778
Expeditors, production controllers	8,673	60	0.7	-192	252
File clerks	49,489	2,528	5.1	-551	3,079
Insurance adjusters, examiners	7,685	185	2.4	-62	247
Library attendants, assistants	4,826	342	7.1	68	274
Mail carriers, post office	14,271	115	0.8	-122	237
Mail handlers, exc. post office	15,983	743	4.6	12	731
Messengers and office boys	13,644	604	4.4	-356	960
Meter readers, utilities	933	13	1.4	-4	17
Payroll, timekeeping clerks	10,046	498	5.0	-7	505
Postal clerks	27,758	439	1.6	-309	748
Proofreaders	2,276	98	4.3	-45	143
Real estate appraisers	807	33	4.1	1	32
Receptionists	21,833	1,411	6.5	-105	1,516
Shipping, receiving clerks	30,342	15	0	-795	810
Statistical clerks	25,683	1,058	4.1	-235	1,293
Stock clerks, store keepers	22,872	379	1.7	-253	632
Teachers' aides, exc. monitors	15,021	1,288	8.6	700	588
Telegraph messengers	346	-24	-6.9	-32	8
Telegraph operators	584	-29	-5.0	-53	24
Telephone operators	29,217	1,307	4.5	-657	1,964
Ticket station, express agents	10,549	398	3.8	0	398
Weighers	924	7	0.8	-24	31
Misc. clerical workers, n.e.c.	44,561	3,069	6.9	938	2,131

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Molder apprentices	0	0	0	0	0
Pattern and model makers	780	-19	-2.4	-40	21
Rollers and finishers, metal	186	-1	-0.5	-5	4
Sheet metal workers, tinsmiths	2,879	-66	-2.3	-126	60
Sheet metal apprentices	76	-1	-1.3	-1	0
Tool and diemakers	3,267	-76	-2.3	-158	82
Tool and diemaker apprentices	34	-1	-2.9	-1	0
Mechanics, repairmen, installers	82,316	1,239	1.5	-212	1,451
Air conditioning, heating, refrigeration	6,972	234	3.4	116	118
Aircraft	5,128	147	2.9	84	63
Auto accessories installers	174	0	0	-4	4
Auto body repairmen	1,803	21	1.2	-1	22
Auto mechanics	26,484	434	1.6	-1	435
Auto mechanic apprentices	60	1	1.7	0	1
Data-processing machine repairmen	2,718	125	4.6	108	17
Farm implements	420	-3	-0.7	-10	7
Heavy equipment mechanics, incl. diesel	17,651	48	0.3	-326	374
Household appliance mechanics	4,499	84	1.9	-6	90
Loom fixers	10	-1	-10.0	-1	0
Office machine repairmen	2,109	10	0.5	-23	33
Radio, television repairmen	4,853	6	0.1	-77	83
Railroad, car shop repairmen	2,913	84	2.9	22	62
Mechanics, exc. auto apprentices	160	-1	-0.6	-2	1
Other mechanics and repairmen	6,362	50	0.8	-91	141
Printing trades craftsmen	26,530	-296	-1.1	-1,006	710
Bookbinders	2,406	8	0.3	-85	93
Compositors and typesetters	10,156	-160	-1.6	-477	317
Electrotypers, stereotypers	170	-6	-3.5	-12	6
Engravers, exc. photoengravers	676	-7	-1.0	-29	22
Photoengravers, lithographers	2,256	18	0.8	-31	49
Pressmen and plate printers	10,611	-132	-1.2	-352	220
Pressman apprentices	56	-1	-1.8	-1	0
Printing apprentices, exc. pressmen	199	-16	-8.0	-19	3

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Transportation, public utility craftsmen	22,823	96	0.4	-155	251
Electric power linemen, cablemen	1,801	23	1.3	1	22
Locomotive engineers	468	0	0	-17	17
Locomotive firemen	79	-5	-6.3	-6	1
Power station operators	330	11	3.3	0	11
Telephone installers, repairmen	18,312	99	0.5	-87	186
Telephone linemen, splicers	1,833	-32	-1.8	-46	14
Other craftsmen, kindred workers	62,967	415	0.7	-2,003	2,418
Bakers	7,626	-137	-1.8	-372	235
Cabinetmakers	3,016	-20	-0.7	-124	104
Carpet installers	1,809	-3	-0.2	-24	21
Cranemen, derrickmen, hoistmen	1,435	-11	-0.8	-42	31
Decorators, window dressers	3,012	54	1.8	-67	121
Dental laboratory technicians	2,487	87	3.5	14	73
Furniture and wood finishers	1,059	-9	-0.9	-49	40
Furriers	754	-9	-1.2	-57	48
Glaziers	1,285	20	1.6	-7	27
Inspectors, log and lumber	55	-1	-1.8	-3	2
Inspectors, other	4,997	77	1.5	-70	147
Jewelers and watchmakers	7,263	116	1.6	-155	271
Millers, grain, flour, feed	35	0	0	-1	1
Motion picture projectionists	1,279	71	5.6	-25	96
Opticians, lens grinders, polishers	1,585	39	2.4	-16	55
Piano, organ tuners, repairmen	231	3	1.3	-10	13
Shipfitters	82	-4	-4.9	-8	4
Shoe repairmen	2,432	10	0.4	-151	161
Sign painters and letterers	723	2	0.3	-27	29
Stationary engineers	4,863	58	1.2	-98	156
Stone cutters, stone carvers	241	0	0	-10	10
Tailors	11,364	51	0.5	-518	569
Upholsterers	2,284	76	3.3	-26	102
Craftsmen, kindred workers, n.e.c.	2,877	-51	-1.8	-152	101
Craft apprentices, n.e.c.	173	-4	-2.3	-5	1

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Dressmakers, seamstresses, exc. factory	6,478	345	5.3	-108	453
Drillers, earth	557	-13	-2.3	-25	12
Dry wall installers, lathers	1,615	20	1.2	-2	22
Dyers	1,049	1	0.1	-29	30
Filers, polishers, sanders, buffers	3,998	-122	-3.1	-238	116
Garage workers, gas station attendants	5,798	-36	-0.6	-135	99
Laundry, dry cleaning operatives	10,588	221	2.1	-257	478
Meat cutters, butchers, exc. mfg.	10,992	-178	-1.6	-499	321
Meat cutters, butchers	987	-53	-5.4	-78	25
Milliners	155	-4	-2.6	-18	14
Mine operatives, n.e.c.	153	0	0	-3	3
Mixing operatives	2,019	-45	-2.2	-90	45
Oilers, greasers, exc. auto	770	-22	-2.9	-45	23
Painters, mfg. articles	2,791	-59	-2.1	-127	68
Photographic process workers	6,533	162	2.5	-32	194
Riveters and fasteners	705	-4	-0.6	-31	27
Sailors and deckhands	3,239	-109	-3.4	-187	78
Sawyers	989	0	0	-30	30
Sewers and stitchers	94,935	2,238	2.4	-3,709	5,947
Shoemaking machine operatives	1,338	-71	-5.3	-144	73
Stationary firemen	3,987	15	0.4	-102	117
Winding operatives, n.e.c.	742	0	0	-25	25
Machine operatives, misc. specified	24,705	-253	-1.0	-1,008	755
Operatives, n.e.c.	25,087	-145	-0.6	-986	841
Transport equipment operatives	133,581	1,281	1.0	-1,589	2,870
Boatmen and canalmen	154	-6	-3.9	-10	4
Bus drivers	17,120	614	3.6	206	408
Conductors, motormen, urban railmen	6,283	126	2.0	28	98
Delivery and routemen	32,062	-45	-0.1	-639	594
Fork lift, tow motor operatives	3,683	-51	-1.4	-107	56
Motormen, mine, factory, logging	190	0	0	-4	4
Parking attendants	2,392	53	2.2	-18	71
Railroad brakemen	426	-12	-2.8	-20	8
Railroad switchmen	1,007	26	2.6	4	22
Taxicab drivers, chauffeurs	26,994	806	3.0	-55	861
Truck drivers	43,270	-230	-0.5	-974	744

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Operatives	454,589	3,273	0.7	-13,572	16,845
Operatives, exc. transport	321,008	1,992	0.6	-11,983	13,975
Semiskilled metalworking	16,849	-93	-0.6	-495	402
Drill press operatives	731	-9	-1.2	-30	21
Furnacemen, smeltermen, pourers	694	-7	-1.0	-20	13
Grinding machine operatives	930	-2	-0.2	-23	21
Heaters, metal	9	-1	-11.1	-1	0
Lathe, milling machine operatives	1,780	-26	-1.5	-66	40
Metal platers	1,071	-16	-1.5	-39	23
Other precision machine operatives	966	0	0	-20	20
Punch stamping press operatives	1,535	-28	-1.8	-77	49
Solderers	1,456	-3	-0.2	-71	68
Welders and flame cutters	7,677	-1	0	-148	147
Semiskilled textile operatives	7,543	-16	-0.2	-330	314
Carding, lapping, combing	18	-1	-5.6	-2	1
Knitters, loopers, and toppers	2,564	-40	-1.6	-134	94
Spinners, twisters, winders	532	17	3.2	-11	28
Weavers	203	1	0.5	-8	9
Other textile operatives	4,226	7	0.2	-175	182
Semiskilled packing, inspecting	43,668	461	1.1	-1,355	1,816
Checkers, examiners, etc., mfg.	11,185	73	0.7	-332	405
Graders and sorters, mfg.	1,112	2	0.2	-50	52
Meat wrappers, retail trade	2,057	97	4.7	-10	107
Packers, wrappers, exc. meat, produce	29,004	278	1.0	-957	1,235
Produce graders, packers, exc. factory, farm	310	11	3.6	-6	17
Other operatives, exc. transport	252,948	1,640	0.6	-9,803	11,443
Asbestos, insulation workers	349	-4	-1.2	-10	6
Assemblers	17,030	-33	-0.2	-681	648
Blasters and powdermen	57	-1	-1.8	-2	1
Bottling, canning operatives	1,418	-27	-1.9	-71	44
Chainmen, rodmen, axmen, surveying	68	-1	- 1.5	- 2	1
Clothing ironers and pressers	13,422	-169	-1.3	-775	606
Cutting operatives, n.e.c.	10,394	-13	-0.1	-354	341

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
School monitors	1,083	79	7.3	37	42
Ushers, recreation, amusement	1,464	-12	-0.8	-56	44
Welfare service aides	3,394	334	9.8	193	141
Protective service workers	87,495	2,574	2.9	537	2,037
Crossing guard, bridge tenders	3,068	137	4.5	-24	161
Firemen, fire protection	12,418	297	2.4	158	139
Guards and watchmen	30,593	1,306	4.3	-10	1,316
Marshals and constables	182	11	6.0	2	9
Policemen and detectives	40,157	781	1.9	399	382
Sheriffs and bailiffs	1,077	42	3.9	12	30
Private household workers	46,490	1,454	3.1	-2,226	3,680
Child care workers	4,326	144	3.3	-215	359
Cooks, private	2,360	111	4.7	-95	206
Housekeepers, private	6,219	207	3.3	-283	490
Laundresses, private	272	8	2.9	-19	27
Maids, servants, private	33,313	984	3.0	-1,614	2,598
Laborers, except farm	104,508	197	0.2	-1,932	2,129
Animal caretakers, exc. farm	1,341	72	5.4	16	56
Carpenter helpers	475	-17	-3.6	-24	7
Construction laborers, exc. carpenter helpers	17,288	-125	-0.7	-440	315
Fishermen and oystermen	193	-2	-1.0	-5	3
Freight, material handlers	25,829	-95	-0.4	-580	485
Garbage collectors	10,796	289	2.7	155	134
Gardeners, groundkeepers, exc. farm	8,366	349	4.2	43	306
Longshoremen and stevedores	9,921	-127	-1.3	-383	256
Lumbermen, raftsmen, woodchoppers	131	2	1.5	-1	3
Stock handlers	18,530	-2	0	-306	304
Teamsters	60	-3	-5.0	-5	2
Vehicle washer, equipment cleaners	3,530	-75	-2.1	-149	74
Warehousemen, n.e.c.	3,024	-63	-2.1	-123	60
Other laborers	5,024	-6	-0.1	-130	124

continued

Table A (continued)

Occupation	1976	Total job openings: Number	Total job openings: Percent of employment	Openings due to growth	Openings due to labor-force separations
Service workers	501,143	17,870	3.6	-6,014	23,884
Cleaning service workers	120,099	5,162	4.3	-278	5,440
Chambermaid, maid exc. private household	8,614	375	4.4	-177	552
Cleaners and charwomen	55,029	2,187	4.0	-421	2,608
Janitors and sextons	56,456	2,600	4.6	320	2,280
Food service workers	111,827	1,296	1.2	-3,613	4,909
Bartenders	9,879	-19	-0.2	-369	350
Busboys	3,116	-104	-3.3	-154	50
Cooks, exc. private	30,991	251	0.8	-916	1,167
Dishwashers	5,002	36	0.7	-108	144
Food counter, fountain workers	8,237	-11	-0.1	-406	395
Waiters	39,840	593	1.5	-1,492	2,085
Food workers, n.e.c. exc. private	14,762	550	3.7	-168	718
Health service workers	66,085	4,717	7.1	945	3,772
Dental assistants	4,742	343	7.2	1	342
Health aides, exc. nursing	9,527	811	8.5	277	534
Health trainees	400	-18	-4.5	-58	40
Lay midwives	44	3	6.8	1	2
Nurses' aides, orderlies	38,570	2,399	6.2	378	2,021
Practical nurses	12,802	1,179	9.2	346	833
Personal service workers	69,147	2,667	3.9	-1,379	4,046
Airline stewardesses	6,047	717	11.9	159	558
Attendants, recreation, amusement	3,066	131	4.3	7	124
Attendants, personal, service, n.e.c.	9,587	249	2.6	-391	640
Baggage porters and bellhops	1,505	-87	-5.8	-136	49
Barbers	5,192	-115	-2.2	-365	250
Boarding, lodging housekeepers	176	-10	-5.7	-27	17
Bootblacks	176	-1	-0.6	-13	12
Child care workers, exc. private	4,964	398	8.0	112	286
Elevator operators	8,691	-380	-4.4	-886	506
Hairdressers, cosmetologists	18,535	1,080	5.8	-15	1,095
Housekeepers, exc. private	5,255	285	5.4	4	281
Personal service apprentices	12	-1	-8.3	-2	1

continued

Table A (continued)

Occupation	1976	Total job openings		Openings due to growth	Openings due to labor-force separations
		Number	Percent of employment		
Farmers and farm workers	1,601	43	2.7	-5	48
Farmers and farm managers	348	15	4.3	1	14
Farm laborers, farm foremen	1,253	28	2.2	-6	34
Farm foremen	34	-1	-2.9	-2	1
Farm laborers, wage workers	1,114	23	2.1	-7	30
Farm laborers, unpaid family	18	1	5.6	0	1
Farm laborers, self-employed	87	5	5.8	3	2

---

a. Figures for 1976 are simple linear interpolations of 1970 and 1980 data, and should not be interpreted as representing cyclical fluctuations in the economy.

b. When total job openings are negative, the number of persons losing jobs is greater than the number of job openings that will result from labor force separations; i.e. job openings will occur, but these openings are not sufficient to absorb all those whose jobs are lost because of the contraction of industry. It should be noted that openings resulting from occupational and geographic mobility are excluded from these estimates because data are currently unavailable. Also, job openings resulting from labor turnover (shifts of workers in a given occupation from one establishment to another) are not included. Thus, even in occupations expected to experience an employment decline, openings will occur for any of the above reasons.

c. Change in employment 1970-80, divided by 10.

d. Openings resulting from retirement, death, women leaving the labor force to raise families, and other labor force separations.

NOTE: Figures are presented in units and thus imply a level of accuracy far beyond the estimating and projection techniques. The figures should be used as indicators of relative growth. The U.S. Manpower Administration recommends that figures for areas of more than one million be rounded to the nearest hundred, and for areas of less than one million to the nearest fifty.

ATTACHMENT F

BIBLIOGRAPHY, Manpower Data Sources

This ATTACHMENT lists selected sources of occupational information, some of which were discussed in this report. The listing is intended to provide a representative sampling in a number of areas that would be useful to occupational/vocational counselors and planners in monitoring new developments in manpower and labor market trends.

General information

U.S. Department of Commerce, Bureau of the Census. Census of Population: 1970 Subject Reports, Final Report PC(2)-7A, *Occupational Characteristics*, 1973.

Employment and unemployment data for detailed occupations by color, sex, class of worker, earnings, and a variety of other characteristics. Data for earlier censuses are available in publications of the same title for the appropriate census years.

U.S. Department of Labor, Bureau of Labor Statistics. *Tomorrow's Manpower Needs*, Bulletin 1606, Supplement 3, 1973.

Contains conversion tables for matching occupational classifications of BLS projections to vocational education program codes. Based on 1960 census.

✓ U.S. Department of Labor, Bureau of Labor Statistics, *Tomorrow's Manpower Needs*, Bulletin 1606, Supplement 3, (Revised), 1975.

Contains conversion tables for matching occupational classifications of BLS projections to vocational education program codes. Based on 1970 census.

U.S. Department of Labor. *Employment and Training Report of the President, 1976*. Annual since 1963 under title *Manpower Report of the President.*

Statistical appendix presents summary data on Federal manpower programs, including total enrollments, completions, and post-training employment. Manpower policy developments of each year are discussed in the text of the report.

✓ U.S. Department of Labor, Manpower Administration. *Manpower Research and Development Projects*. Annual since 1971.

Lists completed research and development projects funded by the Manpower Administration, with annotations.

Training data

U.S. Department of Health, Education, and Welfare, National Center for Educational Statistics, Office of Education. *Digest of Educational Statistics*. Annual since 1962.

Contains data on enrollments, degrees, and other items. Compiled from various sources indicated in table footnotes.

U.S. Department of Health, Education, and Welfare, National Center for Educational Statistics, Office of Education. *Projections of Educational Statistics*. Annual since 1964.

Lists projections of enrollments, graduates, faculty, and expenditures for higher education, as well as similar projections for elementary and secondary schools.

✓ U.S. Department of Health, Education, and Welfare, National Center for Educational Statistics, Office of Education. *Enrollment in Vocational Education Occupation Programs*. Vocational Education Information No. 11. Annual since fiscal year 1966.

Contains enrollments by detailed occupational programs for fiscal years.

U.S. Department of Labor. *Employment and Training Report of the President, 1976*. Annual since 1963 under title *Manpower Report of the President*.

Contains summary data on annual new registrations, cancellations, and completions of apprenticeship training since 1947.

Neary, H. James. "The BLS Pilot Survey of Training in Industry," *Monthly Labor Review*, February 1974, pp. 26–32.

Describes the results of the BLS pilot survey of training in metalworking industries, including methods of data collection and the survey design. The pilot survey was conducted to determine whether reliable data could be collected on training enrollments and completions in industry.

U.S. Department of Defense, Office of Assistant Secretary. *Selected Manpower Statistics.* Annual.

Data on persons discharged from the Armed Forces, by broad military job classification.

✓ U.S. Department of Health, Education, and Welfare, National Center for Educational Statistics, Office of Education. *Directory of Postsecondary Schools with Occupational Programs,* 1971. DHEW Publication No. (OE)73-11410, 1973.

A comprehensive list of all schools offering postsecondary occupational training, including private vocational schools as well as 2- and 4-year colleges.

U.S. Department of Health, Education, and Welfare, National Center for Educational Statistics, Office of Education. *Survey of Programs and Enrollments in Postsecondary Schools.* In process 1976.

Survey of a sample of schools drawn from the *Directory* cited in the previous source.

Followup data

Astin, Alexander. *The College Drop Out: A National Profile.* Washington, D.C.: American Council on Education, 1972.

Examines what happens to college dropouts, their entry into the labor force, transfer rates, and likelihood of return to college.

Astin, Helen, and Ann S. Bisconti. *Career Plans of College Graduates of 1965 and 1970.* Bethlehem, Pa.: College Placement Council, Inc., 1972.

Reports on entry to employment by type of employer, undergraduate major, occupation, and other items. Based on data from the American Council on Education.

Astin, Helen, and Ann S. Bisconti. *Undergraduate and Graduate Study in Scientific Fields.* Washington, D.C.: American Council on Education, ACE Research Reports, Vol. 8, No. 3, August 1973.

This report examines the flow of a national cohort of college freshmen of 1961 over a decade focusing on patterns of undergraduate study, attrition, degree attainment, advanced study, and employment. Findings on the progress and goals of 1966 freshmen are included as a means of comparison with the 1961 cohort. Contains 78 separate cross-tabulations.

Astin, Helen, Elaine El-Khawas, and Ann S. Bisconti. *Beyond the College Years.* Washington, D.C.: American Council on Education, 1974.

Report prepared for the National Science Foundation and the National Institutes of Health, uses correlation and regression analysis to examine factors associated with career outcomes and presents data on career flows.

Bayer, Alan, Jeannie Royer, and Richard Webb. *Four Years After College Entry.* Washington, D.C.: American Council on Education, ACE Research Reports, Vol. 8, No. 1, 1973.

Followup of a sample of the freshmen class of 1967.

College Placement Council, Inc. *The College Graduate: Turnover and Mobility.* Report No. 3, Bethlehem, Pa., 1970.

Using National O[illegible]on Research Center data for 33,000 graduate[illegible]he class of 1961, the report studies labor fo[illegible]obility and job changing during five years after graduation. Detail includes degree field, type of employer, and sex. Earlier reports in the series dealt with graduates' attitudes toward business, and job satisfaction.

College Placement Council, Inc. *College Graduates and Their Employers—A National Study of Career Plans and Their Outcomes.* Report No. 4, 1975.

Actual occupations of college graduates compared with college-year plans. Analyses flow directly from *Career Plans of College Graduates of 1965 and 1970* (see above), but provide greater detail in classification of majors and careers.

College Placement Council, Inc. *The Hard-to-Place Majority—A National Study of the Career Outcomes of Liberal Arts Graduates.* Report No. 5, 1975.

Actual occupations of college graduates compared with field of study. Analyses flow directly from *Career Plans of College Graduates of 1965 and 1970* (see above), with emphasis on liberal arts graduates.

College Placement Council, Inc., *Four-Year Liberal Arts Graduates: Their Utilization in Business, Industry, and Government—The Problem and Some Solutions,* 1975.

A position statement covering the dilemma facing liberal arts graduates, dimensions of the dilemma, new directions, areas in which action is needed, and conclusions.

El-Khawas, Elaine, and Ann S. Bisconti. *Five and Ten Years After College Entry*. Washington, D.C.: American Council on Education, ACE Research Reports, Vol. 9, No. 1, 1974.

Descriptive report including 1971 data on college freshmen of 1961 and 1966.

Engineering Manpower Commission. *Engineering and Technology Graduates*. New York: Engineers Joint Council. Annual.

Survey of 2-year associate degrees granted for completion of engineering and technology curriculums.

Engineering Manpower Commission. *Placement of Engineering Graduates*. New York: Engineers Joint Council. Annual.

Data from a survey of over 200 engineering schools provide information on the placement status of 24,000 technical and 14,500 nontechnical graduates who received bachelor's degrees. Number and percentages of graduates entering employment, graduate school, and military service are given.

National Research Council, National Academy of Sciences. *Careers of Ph.D.'s — Academic Versus Non-Academic — A Second Report on Follow-up of Doctorate Cohorts 1935–1960*. Career Patterns Report No. 2, Publication 1577, 1968.

By studying the careers of 10,000 holders of third-level research degrees, systematically selected from the graduating classes of 1935, 1940, 1950, 1955, and 1960, this report focuses on the factors associated with choice of employment in academic or other settings, with particular emphasis on the circumstances surrounding a change in employer category.

Sharp, Laure M., et. al. *Five Years After the College Degree*. Washington, D.C.: Bureau of Social Science Research, 5 volumes:

- Part I: *Graduate and Professional Education*. 1965.
- Part II: *Occupational Outcome* (Text Tables: Appendix Tables). 1965.
- Part III: *Methodological Note*. 1966.
- Part IV: *Military Service*. 1967.
- Part V: *Geographic Mobility*. 1967.

Based on a survey in 1963 of 1958 bachelor's degree recipients including a subsample of individuals surveyed in the National Science Foundation study, *Two Years After the College Degree*, who obtained further graduate and professional education during 1958–63. Describes occupational entry and other characteristics by type of training.

✓ Duis, Harold. "Employment of Vocational Program Graduates," *American Education*, February 1968.

Gives data on entrance rates of graduates from vocational training programs into different occupational classifications.

✓ Somers, Gerald G. *The Effectiveness of Vocational and Technical Programs: A National Follow-up Study*. Madison: University of Wisconsin, Center for Studies in Vocational and Technical Education, 1971.

Based on a 1969 survey of a national sample of 1966 vocational and technical program graduates, reports labor force and employment status by type of program, major occupational classification, and personal characteristics.

Sharp, Laure M., and Albert D. Biderman. *Employment of Retired Military Personnel*. BSSR 361. Washington, D.C.: Bureau of Social Science Research, 1966.

A detailed study of the employment practices of those leaving the military. Occupational information is given by age, race, and rank. Excerpts are published in the *Monthly Labor Review*, January and February, 1967.

Project Talent—One Year Follow-up Studies. Pittsburgh: University of Pittsburgh, School of Education, 1966.

From an original study in 1966 of a 5-percent sample of high school students (440,000) in 1,353 schools, the report compiles information on each group one year after graduation. It studies the nature of their employment and job satisfaction, the nature and extent of their post-high school education, and long-range career plans.

Project Talent—A 5-year Follow-up Information on High School Graduates of 1960. Pittsburgh: University of Pittsburgh, School of Education, July 1969.

A continuing followup of the high school graduates, their activities during the 5 years after graduation, examining employment and continuing education.

✓ **U.S. Department of Health, Education, and Welfare, National Center for Educational Statistics, Office of Education. *National Longitudinal Study of the High School Class of 1972, Comparative Profiles—One and One-Half Years After Graduation*. DHEW Publication No. (NCES) 76–220, 1975.**

Study is designed to followup a sample of 20,000 high school seniors of 1972 for several years to examine their postsecondary educational and occupational status, and its relation to high school training experience.

Occupational transfers

A promising source of occupational mobility data is the 5-percent sample of the 1970 Census, which provides information on occupations in 1970 and in 1965. Data are published only for 10 major occupation groups. However, unpublished tabulations for detailed occupations obtained by the Bureau of Labor Statistics are currently being analyzed. Several articles dealing with this subject are scheduled to be published in the *Monthly Labor Review* in 1976.

Seltzer, Norman. "The 1972 Postcensal Survey of Professional, Scientific, and Technical Manpower," American Statistical Association, *Proceedings of the Social Statistics Section*, 1972, 1973, pp. 178–80.

Parnes, Herbert S. "Longitudinal Surveys: Prospects and Problems," *Monthly Labor Review*, February 1972, pp. 11–15.

Discusses the surveys and lists additional articles and reports based on survey data.

Byrne, James J. "Occupational Mobility of Workers," *Monthly Labor Review*, February 1975, pp. 53–59.

Discusses occupational mobility of workers between January 1972 and January 1973 by age, sex, and race, and compares results of postcensal survey to those of a similar survey in 1965.

Geographic migration

U.S. Department of Commerce, Bureau of the Census, Census of Population: 1960, Subject Reports, Final Report PC(2)–2B, *Mobility for States and State Economic Areas*, 1963.

Contains data on economic, demographic, and social characteristics, including major occupational groups, of the population classified by mobility status.

U.S. Department of Commerce, Bureau of the Census, Census of Population: 1970, Subject Reports, Final Report PC(2)–7E, *Occupation and Residence in 1965*, 1973.

Geographic mobility data for major occupational groups, comparable 1960 data are in Final Report PC(2)–2B, *Mobility for States and State Economic Areas*.

Sharp, Laure M., et. al. Five Years After the College Degree. Washington, D.C.: Bureau of Social Science Research, 5 volumes: Part V: *Geographic Mobility*, 1967.

Based on a survey in 1963 of 1958 bachelor's degree recipients including a subsample of individuals surveyed in the National Science Foundation study, *Two Years After the College Degree*, who obtained further graduate and professional education during 1958–63.

Immigration

National Science Foundation. *Immigrant Scientists and Engineers in the United States. A Study of Characteristics and Attitudes*. NSF 73–302, 1973.

Reports on a survey conducted by NSF in mid-1970 of a sample of those admitted between February 1964 and January 1969 and who filed address reports with the Immigration and Naturalization Service in 1969.

U.S. Department of Health, Education, and Welfare, National Institutes of Health. *The Foreign Medical Graduate: A Bibliography*. DHEW Publication No. (NIH) 73–440, November 1972.

Citations of information about foreign medical graduates in the United States, including their education abroad, flow into the United States, and their training and use in the United States. Includes only publications before September 1972.

Entrants from outside the labor force

American Nurses Association. *The Nation's Nurses: Inventory of Registered Professional Nurses*. 1965.

Data on work activity and labor force mobility characteristics of R.N.'s.

National Education Association. *Status of the American Public School Teacher, 1970–71*. Research Report 1972–R3, 1972.

Data on reentrants.

U.S. Department of Commerce, Bureau of the Census. Census of Population: 1970, Subject Reports, Final Report PC(2)-6C, *Persons Not Employed*, 1973.

Data on occupational characteristics of persons not in the labor force or unemployed. Comparable 1960 data in Final Report PC(2)-6C, *Labor Reserve*.

Separations from the labor force

Fullerton, Howard N. "A New Type of Working Life Table for Men," *Monthly Labor Review*, July 1972, pp. 20–27.

Uses a "generation" life table in which the life spans of cohorts are followed through time, instead of a "period" life table based on mortality rates applicable to each age observed at one point in time. Includes tables, data sources, and technical appendix.

U.S. Department of Labor, Bureau of Labor Statistics. *Tomorrow's Manpower Needs*, Bulletin 1606, Vol. 1, February 1969, and Supplement 4, *Estimating Occupational Separations from the Labor Force for States*, 1974.

Vol. 1 discusses the development of death and separation rates, and shows 1960 rates for individual occupations by sex in appendix A. Supplement 4 contains estimates of occupational separations for States and shows 1970 and 1985 rates for individual occupations by sex in appendix B.

Earnings

Directory of Industry Wage Surveys and Union Wages and Hours Studies, 1960–75, 1976.

Lists industries covered in the BLS industry wage survey program, including publication titles, bulletin numbers, and a limited description of their content.

Area Wage Surveys, Metropolitan Areas, United States and Regional Summaries, 1973–74. Bulletin 1850-28, 1976. Annual since 1950, various bulletin numbers. Before Bulletin 1465 (1965–66) the series were called Occupational Wage Surveys. Data for individual metropolitan areas are published in individual volumes.

College Placement Council, Inc. *Men's Salary Survey and Women's Salary Survey*. Annual.

Data include high, low, and average beginning salaries in business and industry, by type of curriculum and type of employment (industry), for recent college graduates. Data are collected from college placement offices, covering male graduates in accounting, business, humanities–social sciences, marketing, seven areas of engineering, agricultural science, chemistry–math–physics, and computer science, and female graduates in accounting, business communications, community service work, EDP, engineering, health, home economics, libraries, mathematics, merchandising, research, and secretarial services.

Endicott, Frank S. *Trends in Employment of College and University Graduates in Business and Industry*. American Society for Personnel Administration. Annual since 1946.

Survey of beginning monthly salaries in 185 companies representing large- and medium-sized firms in 22 States and 20 industries. Salaries are for bachelor's and master's degree holders in engineering, accounting, sales, business administration, liberal arts, production management, physics, chemistry, mathematics, economics, and other fields.

Professional and business associations. The following associations or periodicals conduct salary surveys for occupations of special interest to them:

Advertising Age (magazine)
American Dental Association
American Dental Assistants Association
American Dental Hygienists Association
American Insurance Association/American Mutual Insurance Alliance
American Marketing Association
American Medical Association
American Medical Record Association
American Osteopathic Association
American Speech and Hearing Association
Business Automation, EDP Salary Survey
Flight Engineers International Association
Life Office Management Association, Actuarial Student Salary Survey
National Association of Certified Dental Laboratories
National Farm and Power Equipment Dealers Association
Public Personnel Association, *Pay Rates in Public Service*

U.S. Department of Labor, Bureau of Labor Statistics. *National Survey of Professional, Administrative, Technical, and Clerical Pay*. Annual since Winter 1959–60, various bulletins.

Data on salary levels and distributions and 80 occupation-work levels, including accounting, legal services, personnel management, engineering and chemistry, buying, clerical supervisory, drafting, and clerical jobs. Averages are shown for annual, monthly, or weekly rates, excluding overtime pay. Data are shown for total United States, for metropolitan areas combined, for establishments of 2,500 or more, and for major industry divisions.

Sommers, Dixie, "Occupational Rankings for Men and Women by Earnings," *Monthly Labor Review*, August 1974, pp. 34–51.

Ranks selected occupations of men and women according to 1969 median earnings, based on 1970 Census data.

Periodicals

U.S. Department of Labor, Bureau of Labor Statistics. *Employment and Earnings*, monthly.

Presents charts and detailed tables on the labor force, employment, unemployment, hours, earnings, and labor turnover. Compiled from data based on household interviews, nonagricultural establishment records, and administrative records of unemployment insurance systems. March issue contains annual averages for previous year for al national industry series.

U.S. Department of Labor, Employment and Trainin Administration. *Worklife*, monthly.

Presents articles on a wide variety of manpower-related topics — people, jobs, poverty, employment and unemployment, transportation, education, economics, housing, training, health services, upgrading, apprenticeship, research.

U.S. Department of Labor, Bureau of Labor Statistics *Monthly Labor Review*.

Presents articles on employment, labor force, wages, prices, productivity, unit labor costs, collective bargaining, workers' satisfaction, socia indicators, and labor developments abroad. Regular features include a review of developments i industrial relations, significant court decisions i labor cases, book reviews, and current labor statistics.

U.S. Department of Labor, Bureau of Labor Statistics *Occupational Outlook Quarterly*.

Presents current information on employment trends and outlook, supplementing and updating information in the *Occupational Outlook Handbook*.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1976 O-241-016(13)

Occupational Outlook Handbook Reprints, 1976-77

Bulletin No.		Price (cents)
1875-1	Tomorrow's Jobs	35

INDUSTRIAL PRODUCTION AND RELATED OCCUPATIONS

Bulletin No.		Price (cents)
1875-2	Foundry Occupations Coremakers, Molders, Patternmakers	35
1875-3	Machining Occupations All-round Machinists, Instrument Makers (Mechanical), Machine Tool Operators, Set-up Workers (Machine Tools), Tool-and-Die Makers	35
1875-4	Printing and Publishing Bookbinders, Composing Room Occupations, Electrotypers and Stereotypers, Lithographic Occupations, Photoengravers, Printing Press Operators and Assistants	35
1875-5	Factory Production Occupations Assemblers, Electroplaters, Inspectors, Power Truck Operators, Production Painters	35
	*Automobile Painters (See Mechanics and Repairers)	
1875-6	Blacksmiths	35
1875-7	Blue-Collar Worker Supervisors	35
1875-8	Boilermaking Occupations	35
1875-9	Forge Shop Occupations	35
1875-10	Furniture Upholsterers	35
	*Millwrights (See Mechanics and Repairers)	
1875-11	Motion Picture Projectionists	35
	*Ophthalmic Laboratory Technicians (See Health Occupations)	
	*Photographic Laboratory Workers (See Art, Design, and Communications-Related Occupations)	
1875-12	Stationary Engineers, Boiler Tenders	35
1875-13	Waste Water Treatment Plant Operators	35
1875-14	Welders	35

OFFICE OCCUPATIONS

Bulletin No.		Price (cents)
1875-15	Bookkeeping Workers, Office Machine Operators	35
1875-16	Cashiers	35
1875-17	Collection Workers	35
1875-18	File Clerks	35
	*Hotel Front Office Clerks (See Industry Section—Hotels)	
	*Postal Clerks (See Industry Section—Postal Service).	
1875-19	Receptionists	35
1875-20	Shipping and Receiving Clerks, Stock Clerks	35
1875-21	Statistical Clerks	35
1875-22	Secretaries, Stenographers, Typists	35
1875-23	Computer and Related Occupations Computer Operating Personnel, Programmers, Systems Analysts	35
1875-24	Banking Occupations Bank Clerks, Bank Tellers, Bank Officers	35
1875-25	Insurance Occupations Claim Representatives, Underwriters, Actuaries, Insurance Agents and Brokers	35
1875-26	Accountants	35
1875-27	Advertising, Marketing Research, Public Relations Workers	35
1875-28	Buyers	35
1875-29	City Managers	35
1875-30	Credit Managers	35
	*Hotel Managers and Assistants (See Industry Section—Hotels)	
1875-31	Industrial Traffic Managers, Purchasing Agents	35
1875-32	Lawyers	35
1875-33	Personnel and Labor Relations Workers, College Student Personnel Workers	35
1875-34	Urban Planners	35

SERVICE OCCUPATIONS

Bulletin No.		Price (cents)
1875-35	Building Custodians	35
	*Hotel Housekeepers and Assistants (See Industry Section—Hotels)	
1875-36	Pest Controllers	35
1875-37	Bartenders, Cooks and Chefs, Waiters and Waitresses	35
1875-38	Dining Room Attendants and Dishwashers, Food Counter Workers	35
1875-39	Meatcutters	35
1875-40	Barbers, Cosmetologists	35
	*Bellhops and Bell Captains (See Industry Section—Hotels)	
1875-41	Funeral Directors and Embalmers	35
1875-42	Private Household Workers	35
1875-43	FBI Special Agents	35
1875-44	Firefighters	35
1875-45	Guards	35
1875-46	Police Officers, State Police Officers	35
1875-47	Health and Regulatory Inspectors, Construction Inspectors, Occupational Safety and Health Workers	35
	*Postal Mail Carriers (See Industry Section—Postal Service)	
	*Telephone Operators (See Mechanics and Repairers)	

EDUCATION AND RELATED OCCUPATIONS

Bulletin No.		Price (cents)
1875-48	Teachers Kindergarten and Elementary School, Secondary School, College and University	35
1875-49	Library Occupations Librarians, Library Technicians and Assistants	35

SALES OCCUPATIONS

Bulletin No.		Price (cents)
	*Automobile Parts Counter Workers (See Mechanics and Repairers)	
1875-50	Automobile Salesworkers	35

Bulletin No.		Price (cents)
	*Automobile Service Advisers (See Mechanics and Repairers)	
	*Gasoline Service Station Attendants (See Mechanics and Repairers)	
	*Insurance Agents and Brokers (See Office Occupations)	
1875-51	Manufacturers' Salesworkers	35
1875-52	Real Estate Salesworkers and Brokers	35
1875-53	Retail Trade Salesworkers	35
	*Route Drivers (See Transportation Occupations)	
1875-54	Securities Salesworkers	35
1875-55	Wholesale Trade Salesworkers	35
1875-56	Models	35

CONSTRUCTION OCCUPATIONS

1875-57	Asbestos and Insulation Workers	35
1875-58	Bricklayers, Stonemasons, Marble Setters, Tile Setters, Terrazzo Workers	35
1875-59	Carpenters, Painters and Paperhangers, Glaziers	35
1875-60	Cement Masons, Lathers, Plasterers	35
1875-61	Construction Laborers	35
1875-62	Drywall Installers and Finishers	35
1875-63	Electricians (Construction)	35
1875-64	Elevator Constructors, Structural, Ornamental, and Reinforcing Ironworkers; Riggers; Machine Movers	35
1875-65	Floor Covering Installers	35
1875-66	Operating Engineers	35
1875-67	Plumbers and Pipefitters	35
1875-68	Roofers, Sheet-metal Workers	35

TRANSPORTATION OCCUPATIONS

1875-69	Civil Aviation Occupations Air Traffic Controllers, Airplane Mechanics, Airplane Pilots, Flight Attendants, Reservation, Ticket, and Passenger Agents	35
1875-70	Merchant Marine Merchant Marine Officers, Merchant Marine Sailors	35
1875-71	Railroad Occupations Brake Operators, Conductors, Locomotive Engineers, Shop Trades, Signal Department Workers, Station Agents, Telegraphers, Telephoners, Tower Operators, Track Workers	35
1875-72	Driving Occupations Intercity Busdrivers, Local Transit Busdrivers, Local Truckdrivers, Long Distance Truckdrivers, Route Drivers, Taxicab Drivers	35
1875-73	Parking Attendants	35

SCIENTIFIC AND TECHNICAL OCCUPATIONS

1875-74	Conservation Occupations Foresters, Forestry Technicians, Range Managers, Soil Conservationists	35
1875-75	Engineers Aerospace, Agricultural, Biomedical, Ceramic, Chemical, Civil, Electrical, Industrial, Mechanical, Metallurgical, Mining, Petroleum	35
1875-76	Environmental Scientists Geologists, Geophysicists, Meteorologists, Oceanographers	35
1875-77	Life Science Occupations Biochemists, Life Scientists, Soil Scientists	35
1875-78	Mathematics Occupations Mathematicians, Statisticians	35
1875-79	Physical Scientists Astronomers, Chemists, Food Scientists, Physicists	35
1875-80	Drafters, Engineering and Science Technicians, Surveyors	35
	*Broadcast Technicians (See Industry Section—Radio and TV Broadcasting)	

MECHANICS AND REPAIRERS

1875-81	Telephone Occupations Telephone Craft Occupations, Central Office Craft Occupations, Central Office Equipment Installers, Line Installers and Cable Splicers, Telephone and PBX Installers and Repairers, Telephone Operators	35
1875-82	Automobile Service Occupations Automobile Body Repairers, Automobile Mechanics, Truck and Bus Mechanics, Automobile Service Advisers, Automobile Parts Counter Workers, Gasoline Service Station Attendants, Automobile Painters	35
1875-83	Air-conditioning, Refrigeration, and Heating Mechanics	35
1875-84	Appliance Repairers	35
1875-85	Boat-Motor Mechanics, Motorcycle Mechanics	35
1875-86	Bowling-Pin-Machine Mechanics	35
1875-87	Business Machine Repairers, Computer Service Technicians	35
1875-88	Diesel Mechanics	35
1875-89	Electric Sign Repairers	35
1875-90	Farm Equipment Mechanics	35
1875-91	Maintenance Electricians, Industrial Machinery Repairers, Millwrights	35
1875-92	Instrument Repairers	35
1875-93	Jewelers, Watch Repairers	35
1875-94	Locksmiths	35
1875-95	Piano and Organ Tuners and Repairers	35
1875-96	Shoe Repairers	35
1875-97	Television and Radio Service Technicians	35
1875-98	Vending Machine Mechanics	35

HEALTH OCCUPATIONS

1875-99	Chiropractors	35
1875-100	Optometrists, Optometric Assistants	35
1875-101	Dental Occupations Dentists, Dental Assistants, Dental Hygienists, Dental Laboratory Technicians	35
1875-102	Physicians, Osteopathic Physicians	35
1875-103	Podiatrists	35
1875-104	Veterinarians	35
1875-105	Medical Technologist, Technician, and Assistant Occupations Electrocardiograph Technicians, Electroencephalographic Technicians, Medical Assistants, Medical Laboratory Workers, Operating Room Technicians, Radiologic (X-ray) Technologists, Respiratory Therapy Workers	35
1875-106	Nursing Occupations Registered Nurses, Licensed Practical Nurses, Nursing Aides, Orderlies, and Attendants	35
1875-107	Therapy and Rehabilitation Occupations Occupational Therapists, Occupational Therapy Assistants, Physical Therapists, Physical Therapist Assistants and Aides, Speech Pathologists and Audiologists	35
1875-108	Dietitians	35

Bulletin No.		Price (cents)
1875-109	Dispensing Opticians, Ophthalmic Laboratory Technicians	35
1875-110	Health Services Administrators	35
1875-111	Medical Record Administrators, Medical Record Technicians and Clerks	35
1875-112	Pharmacists	35

SOCIAL SCIENTISTS

Bulletin No.		Price (cents)
1875-113	Anthropologists, Economists, Geographers, Historians, Political Scientists, Sociologists	35
1875-114	Psychologists	35

SOCIAL SERVICE OCCUPATIONS

Bulletin No.		Price (cents)
1875-115	Counseling Occupations School Counselors, Employment Counselors, Rehabilitation Counselors, College Career Planning and Placement Counselors	35
1875-116	Clergy Protestant Ministers, Rabbis, Roman Catholic Priests	35
	*Cooperative Extension Workers (See Industry Section—Agriculture)	
1875-117	Home Economists	35
1875-118	Recreation Workers	35
1875-119	Social Workers, Social Service Aides	35

ART, DESIGN, AND COMMUNICATIONS-RELATED OCCUPATIONS

Bulletin No.		Price (cents)
1875-120	Performing Arts Actors and Actresses, Dancers, Musicians, Singers	35
1875-121	Architects	35
1875-122	Commercial Artists	35
1875-123	Display Workers	35
1875-124	Floral Designers	35
1875-125	Industrial Designers	35
1875-126	Interior Designers	35
1875-127	Landscape Architects	35
1875-128	Photographers, Photographic Laboratory Occupations	35
1875-129	Newspaper Reporters, Technical Writers	35
1875-130	Interpreters	35
	*Radio and TV Announcers (See Industry Section—Radio and TV Broadcasting)	

SOME MAJOR INDUSTRIES AND THEIR OCCUPATIONS

Bulletin No.		Price (cents)
1875-131	Agriculture Cooperative Extension Service Workers	35
1875-132	Coal Mining	35
1875-133	Petroleum and Natural Gas Production and Gas Processing, Petroleum Refining	35
1875-134	Aircraft, Missile, and Spacecraft Manufacturing	35
1875-135	Aluminum Manufacturing	35
1875-136	Apparel Manufacturing	35
1875-137	Atomic Energy Field	35
1875-138	Baking Industry	35
1875-139	Drug Manufacturing	35
1875-140	Electronics Manufacturing	35
	*Foundries (See Industrial Production and Related Occupations)	
1875-141	Industrial Chemical Industry	35
1875-142	Iron and Steel Industry	35
1875-143	Logging and Lumber Mill Industry	35
1875-144	Motor Vehicle and Equipment Manufacturing	35
1875-145	Office Machine and Computer Manufacturing	35
1875-146	Paper and Allied Products Industry	35
	*Printing and Publishing (See Industrial Production and Related Occupations)	
	*Civil Aviation (See Transportation Occupations)	
1875-147	Electric Power Industry Powerplant Occupations, Transmission and Distribution Occupations, Customer Service Occupations	35
	*Merchant Marine (See Transportation Occupations)	
1875-148	Radio and TV Broadcasting Industry Radio and TV Announcers, Broadcast Technicians	35
	*Railroads (See Transportation Occupations)	
	*Telephone (See Mechanics and Repairers)	
1875-149	Trucking Industry	35
1875-150	Restaurant Industry	35
1875-151	Retail Food Store Industry	35
	*Banking (See Office Occupations)	
	*Insurance (See Office Occupations)	
1875-152	Hotel Occupations Bellhops and Bell Captains, Front Office Clerks, Housekeepers and Assistants, Managers and Assistants	35
1875-153	Laundry and Drycleaning Plants	35
1875-154	Government Occupations Federal Civilian Employment, State and Local Governments, Armed Forces	45
1875-155	Postal Service Postal Clerks, Postal Mail Carriers	35

Available from the Superintendent of Documents, Washington, D.C. 20402, or from any of the regional offices of the Bureau of Labor Statistics, U.S. Department of Labor. A discount of 25 percent will be allowed to quantity purchasers (100 or more copies of a single reprint) when mailed to a single address.

1603 JFK Federal Bldg.
Boston, Mass. 02203

1371 Peachtree St., N.E.
Atlanta, Ga. 30309

911 Walnut St.
Kansas City, Mo. 64106

P.O. Box 13309
Philadelphia, Pa. 19101

230 S. Dearborn St.
Chicago, Ill. 60604

1515 Broadway
New York, N.Y. 10036

450 Golden Gate Ave., Box 36017
San Francisco, Calif. 94102

555 Griffin Square Bldg.
Dallas, Tex. 75202

ATTACHMENT G

The following is a description of articulation between the secondary level and the "next step," as presented in Career Education: The Role of Adult Education (Ohio State University, 1973; ERIC VT 020 369).

Articulation: Defined and Described

Education is assumed to be a continuous process. If this assumption is correct, there should be no problem for the youngster or adult to move from one level to another in pursuit of his or her goals. Menacker (1969; 220), discussing articulation between high school and college, points out that:

> ... student transition in subjects common to successive levels of education has, at times, been characterized by overlap or gaps in subject material, changes in teaching methodology, and other impediments to a smooth, uninterrupted presentation of subject matter to the student.

The overall goal of an articulated educational system is the smooth transition between institutions from kindergarten through continuing education. Linson et al. (1971) specify some of the purposes of articulation. The author is taking the liberty to adapt these purposes to the articulation between secondary and post-secondary educational opportunities. Articulation, then, is designed to:

1) make all segments of education work together to advance the objective of the student;
2) eliminate duplication between school levels;
3) expand the student's opportunities;
4) make related training more effective;
5) give the student a better opportunity to obtain a balanced education by taking courses which are related and meaningful to him;
6) make all levels and all aspects of his education more relevant;
7) enable the individual student to develop and pursue a long-range career plan;
8) improve the quality of education; and
9) make education more efficient and more economical.

At the present time, much of the subject matter offered at the secondary and post-secondary levels creates problems for the students and the institutions. Students completing basic and advanced courses at the secondary level are forced to repeat many of their experiences at the post-secondary level. These conditions are boring for students and inefficient for the school.

Suggestions for Improving Articulation

Suggested activities designed to improve the articulation between adult and career education programs are presented in the following. Local directors of adult and career education programs can examine the educational situation and parcel out the individuals and organizations needing attention, e.g., state and local boards of education for secondary and post-secondary institutions, school superintendents and post-secondary institution directors, teachers, parents, and students.

First, the governing bodies of secondary and post-secondary institutions need to examine their mission for existence and establish that they will serve the educational needs of youth and adults. Local directors can facilitate this decision by providing flexible course schedules, easy entry and exit into curricula, and credit for competency or previous experience.

Second, institution administrators need to support the "service to students mission" and open up their schools to the local community. Local directors can establish contacts with business, industry, and community leaders and bring this expertise into the school. These contact persons can serve as potential advisors and employers for graduates or early-leavers with demonstrated skill competencies.

Third, teachers need to continually upgrade their skills and information about employment and cultural opportunities for youth and adults. Local directors can facilitate staff development by identifying cooperative employment for teachers in business or industry and by providing the opportunity for local resource people to be the "teachers" and on-site experts.

Parents [illegible]

Fourth, parents and students need to develop the attitude that the school approach is only one method of providing educational experiences for youth and adults. Local directors can facilitate attitude development by establishing trust and confidence in student and communication between the adult or career program and the community.

Fifth, communication between school levels is fundamental to increasing articulation and cooperation. Specific activities might include:

1) inclusion of teachers on advisory committees;
2) increased visitation between the different faculty levels;
3) summer workshops offering an opportunity for faculties to work together;
4) establishment of joint curriculum committees in each of the technical fields; and
5) specialized courses offered by the institution to assist teachers in professional and academic advancement (Beach, 1969).

Sixth, involvement of the learner in the education process is a key factor in conducting learning experiences for youth and adults. Involve the student, the teacher, potential employers, and community leaders in designing, implementing, and supporting local career education programs.

Seventh, cooperative planning between the secondary and "next step" level should be considered. Techniques (Mikalson and Bloomquist, 1967) to facilitate planning might include:

1) determining courses that should be offered at the high school and community college levels to assure that the student is given full credit for his high school training and experiences and to minimize redundancy in repeating course work at the community college level;
2) determining which courses should be given at the high school or community college level only;
3) determining gaps between high school and community college curricula and identifying course content to be given at the different levels; and

4) determining whether other programs should be offered at the high school or community college because of unmet student needs in the local area.

These suggestions are not exhaustive or mutually exclusive. The local director will need to employ all or parts of these activities to get a student-oriented program "off the ground," and in so doing, he will design and implement new techniques for delivering career education to youth and adults.

ATTACHMENT H

The Advisory Committee and Vocational Education

Local Advisory Committees

The functions of the local advisory committee can best be established by stating first what the group is not to do. The numerous provinces which invite participation outweigh the areas closed to committee operation and prevent this approach from being negative.

The duties of the advisory committee should extend beyond giving advice, but the members have neither legislative nor administrative authority.

Formation of these committees is not intended to usurp the prerogatives of the boards of education or of administrative staffs, but occasionally such fears are articulated. Because the approval and support of the board and staff members are vital, they must be assured that, while the danger is present and some advisory committees have tried to move in that direction, the barriers will be firmly placed. A recital of proposed guidelines should convince them that the administrative and legislative boundaries would not be crossed.

After the two restricted fields of operation have been identified to the committee, it is up to the educators and the members to work out how they can best work together to initiate and improve vocational education programs. The areas of assistance are so numerous that imaginative and enterprising laymen and educators are continuing to find new ways in which the committee members might serve.

Therefore, it would be stifling to discuss advisory committee functions in a definitive and final manner. It would appear more reasonable to describe the major charges in order that the educator may have some loose guidelines, but underscore the fact that this, by design and practicality, is not meant to be an inflexible blueprint.

Occupational Surveys

First of all, advisory committees should advise the school administration on the types of offerings required to satisfy the preparatory as well as the retraining and upgrading needs of the individuals of the community. In order to do this effectively, the committee must have more to draw upon than the experience and background of its members. An occupational survey can supplement this knowledge.

As preparations are begun for the project, advisory committees can focus survey directions by helping to identify the type of data to be gathered. They also can be instrumental in gaining public support and can contribute to a climate which would result in favorable community reaction.

The surveys are usually designed to obtain the following type of information:

1. the number of people in a geographic area currently employed in a given occupation, and the additional members needed currently and through the next (usually) five years.
2. the occupation(s) in greatest demand.
3. the jobs within an occupation in which training is needed.
4. the number of graduates from school occupational education programs who might be accepted for employment in a community.
5. the interest of young people and adults in training for selected occupations.

6. the need for supplemental training for people already employed.
7. new areas in which school preparatory or upgrading education and training are needed.
8. which school programs should be expanded, ... discontinued, or established.
9. the education and training requirements of the occupation, job or industry which can be met by a school program.

As the survey results are studied, labor standards must be considered and manpower projections viewed from numerous angles. For example, Burt states:

> It is quite possible that the vacancies in a particular occupational area might reflect extremely rapid turnover rates owing to low wages, poor working conditions, low advancement opportunity, or a combination of these factors. ... Employer projections of manpower needs in [some] occupational fields are high, but is there not a responsibility on the part of vocational education officials in the public school system to consider the implications involved in providing a continuing supply of trained manpower to fill the vacancies in an industry with prevalent poor working conditions or low wages?

National leaders who framed the Vocational Education Act of 1963 saw the vital role that data about manpower needs could play. A section of that law provided for employment offices and educators to enter into a "cooperative arrangement" in order that this information might be exchanged. The Vocational Education Amendments of 1968 authorize $5 million a year for "national, regional, state and local studies and projections of manpower needs for use and guidance of federal, state and local officials, and of advisory councils ..."

The increased mobility of the population adds to the significance of national and state studies for the local committees and school authorities. Since 1947, records have been kept regarding the number of people in the United States who move. Statistics show that each year approximately six and one half percent of the population, or about 12 million people, make a move which carries them across county or state lines. This mobility complicates the local committees' task but it is important that they neither ignore nor be unaware of what is happening on national, regional, and state levels.

Verification of Course Content

Another concern of the committee should be the establishment of practices which will keep instruction practical and functional. In order to keep programs realistic, committees should take an active part in verifying course content since members have the essential, specialized knowledge of the work. Representatives of the fields for which instruction is to be provided must be consulted regarding the skills, instructional materials, equipment, standards for production work or services provided and instructional content. All phases of training should be reviewed periodically in order to keep them occupationally oriented and up-to-date.

An advisory committee can help determine whether or not the vocational education offered is compatible with life situations. It can help keep public schools from drifting away from reality. Sometimes, these groups bear down on the educator and make their points in emphatic ways. The mature working relationship which can be established between committee and educator takes into consideration the emphasis of conviction and derives from these sessions the benefits of advice from men and women who refuse to act as rubber stamps. After a day long meeting with his state advisory council, a state director for an eastern state said, "It was rugged but it was worth every minute of it."

The maintenance of program realism will, of course, be noted by employers and prospective employers. When they realize that the programs have been guided from the beginning by advisory committees, they are usually more willing to accept the graduates. While not involved primarily in individual placement, committees can aid in locating jobs.

The encouragement and stimulation offered the individual teacher is another reason to advocate committee activity. A young teacher can be helped as he begins his career and an older teacher's outlook refreshed and divorced from routine presentation of his subject. One young agriculture teacher in rural Texas began to seek members for his advisory committee shortly after his program was initiated. "I was new in the community and the program was new in the community," he recounted. "I thought the best and quickest way to have the program accepted was to involve leading farmers and ranchers from the area on an advisory committee. Those old boys knew what they were doing and they gave me a lot of help -- and kept me from making a lot of mistakes." The teachers could feel isolated without an active advisory committee, especially if he were the only member of a vocational department.

A coordinator of a business and office program in a Virginia high school works closely with advisory committees and strengthened an area of instruction as a result of a comment made during a break for coffee at one of the sessions. A member of the committee, an executive in a large insurance company, remarked that his employees spent more man-hours looking for material than performing any other one operation. The discussion about the vital effect of proper filing was carried back into the meeting. Today, graduates of this program are considered by employers in the community to take exceptional pride in establishing and maintaining files.

Although members of a committee are not involved directly in hiring teachers, they should be encouraged to make recommendations and these views should be considered carefully. They frequently can suggest occupationally qualified individuals who are capable of handling short-unit, intensive courses, and who possess characteristics essential for effective teaching.

Support for Proposed Legislation

Apart from the direct involvement with the programs, the committee members are invaluable as they support educators in the important area of legislation and appropriations.

Often, advisory committees have backed school administrations in requests for appropriations. Members have appeared at public hearings to support school budget proposals and have spoken before civic groups in the interest of improved vocational education. They have assumed the task of acquainting the citizens of their communities with the needs of the school, and have thus helped to win justified appropriation requests.

In a larger area, advisory committees can have an influence upon legislation at the state and national levels. The organization to which the members belong can be powerful friends of vocational education. When members of manufacturers' associations, service clubs, unions, and other civil groups understand the objectives and needs of a school program, they are more likely to support the necessary legislation -- and with perception and enthusiasm.

According to some authorities, most lay citizens and many school people give little thought to the political aspects of public education and its administration. One educator has concluded that schools are the product of political decisions -- particularly where curriculum, finance and service are concerned. He suggests that the school administrator should be aware that there are influential persons in his area of activity and make every effort "to learn just who they are, what values motivate them, what power resources are available to them, and what the patterns of interaction are which may exist among them."

An advisory committee can be an effective public relations instrument. Community interest and support of vocational education can be increased by the various contacts of committee members. They can speak with the authority of eyewitnesses about the merits of education for the world of work. Members can communicate to the public that schools provide a service to the community but the extent of that service depends upon the interest and participation of laymen. Committees help correlate the work of the program with that of other community agencies, such as the local service clubs and the chambers of commerce, which sponsor youth activities.

Advisory committee members are a source of local strength for local schools, a viable link with the community.

One vocational educator has seen that strength translated into the following functions. He says that they can help the educator:

> [make] community surveys
>
> determine and verify need for training
>
> provide tangible evidence that industry is supporting [the] program
>
> review past accomplishments and forecast trends affecting training and employment
>
> [Evaluate] the programs
>
> [provide] financial, legislative and moral support
>
> interpret the program to the community, to unions, to employers
>
> plan facilities and establish standards for shop and lab planning
>
> establish standards for selecting equipment and instructional materials

secure donations of equipment and supplies

[recognize] new technical developments which require changes in the curriculum

encourage teaching recruits

[by offering guidance] and support ... in technical matters, determine qualifications needed for selecting instructors

select production work to be used as instructional vehicles for accomplishing course objectives

[counsel and guide] students [in relation] to the world of work

provide accurate occupational information

find placement opportunities for students

determine criteria for evaluating student performance

develop cooperative work experience programs for students.

ATTACHMENT I

Facilities Planning

" How To"

Suggested steps in the process of developing a set of educational specifications for a Career Development Center:

1. Determine the:

   a. Number and type of occupations for which training will be offered.

   b. Number and length of sessions.

   c. Number of students to be registered in the center.

   (See Document A: Organization)

2. State the objectives to be pursued in each occupational area; stipulate the behavioral activities which may be anticipated in the course of training to achieve each objective; list the facilities required to support the expected activities.

   (See Document B: Determining the physical requirements necessary to facilities the behaviors required to achieve the learning objectives.)

3. Synthesize the behavioral activities into affinity groupings (curriculum subject areas), and allocate time and space for each grouping in terms of periods per week, and square feet per space.

   (See Document C: a) Medical-Assisting Curriculum
   b) Weekly Programs
   c) Spaces Needed for Medical-Assisting)

4. Schedule the various classes in each area at the center to subject periods and rooms in order to avoid conflicts, and to assure full use of all spaces.

   (See Document D: Program Schedules, and Guidelines for Schedules)

5. Prepare a space relationship diagram, showing the interrelations of the various occupational areas, the common support areas, and administrative spaces; indicated areas for joint use.

   (see Chapter IV)

6. On the basis of the facilities requirements extrapolated in step 2, the spaces synthesis of step 3, and the space relations diagram of step 5, design a schematic layout for a new building to house a Career Development Center.

   (see Chapter IV)

7. Identify existing buildings which might be converted into a Career Development Center; indicate on the plan of each such building the possible location of each space provided in the new building (step 6); prepare specifications for the adaptation of each proposed existing building.

   (See Document E)

8. Estimate capital and operating costs of the new building, and of each proposed conversion; prepare a table of comparisons.

A

COER CAREER DEVELOPMENT CENTER

Organization

Schedule

Two sessions: Morning - 8:45 - 12:30
Afternoon - 12:45 - 4:30

Periods: 5 per session
each period - 45 minutes

Registration

Each session:

Power mechanics	5 classes	125 students
Building trades	5 classes	125 students
Electric/electronic appliances	5 classes	125 students
Business	5	125
Medical assisting	5	125
Total per session	25 classes	625 students
Total in school	50 classes	1250 students

COMPREHENSIVE OCCUPATIONAL EDUCATION RESEARCH

Facilities Planning

Determining the physical requirements necessary to facilitate the behaviors required to achieve the learning objectives

EXAMPLE - MEDICAL ASSISTING

Objectives

11 Knowledge of the health care industry

12 Knowledge of career opportunities in the health care industry

21 Knowledge of the duties and qualifications of a medical assistant, and of the conditions of work

22 Understanding of the psychology of interpersonal relations

Behavioral Activities

A. Listening to the teacher, a visiting speaker or a fellow-student

B. Participation in a recitation period in which the teacher asks questions and the students respond

C. Teacher-led review of answers to questions previously assigned to be worked out at home

D. Oral repetition of material by a student, his peers, or the teacher

Facilities Requirements

110 An area in which a group of 25 students can sit comfortably, and hear and see a speaker or each other clearly, without interference from or to another group

111 Each student, and the teacher or speaker should be able to see all the others frontally, and be seen frontally

112 Each student should be able to pass to and from his/her seat without physically disturbing others

113 The temparature of the learning area should be capable of maintenance at a comfortable level year-round

114 The learning area should be ventilated so as to provide for optimal physiological and physchological functionin

115 Every occupant should be able to see all types of tasks (from the coarsest objects to the finest print) comfortably, speedily, and accurately, from appropriate distance, and in whatever learning situation involved

Objectives	Behavioral Activities	Facilities Requirements
		116 Students should be provided with an esthetic environment and a physical sense of group identity conducive to participation in the learning activity
	E. Written repetition of material, copied from original, or as test response	117 Should have available smooth writing surfaces, large enough to accommodate paper or notebooks measuring 8½ x 13"
	F. Observation of material displayed for simultaneous reception by the entire grou;	117A Means should be available for the teacher or students to display data or graphies for simultaneous visual apperception by the entire group in the learning area
	B. Observation of charts, graphs, models, animate and inaminate illustrative materials See 115 above	
		118 Should be able to get a general impression of a two-dimensional or three-demensional object from any location in the learning area
		119 Means should be provided for the display of two- and three-dimensional materials so that a student may be able to examine them closely at his option, and for extended periods.
		120 Storage space for visual learning aids should be provided close to the point of use
	H. Viewing television programs, motion pictures, filmstrips, slides, or transparency projections as a group	121 Should be able to see a clear, bright, undistorted image on a screen from any location in the area
		122 It should be possible to reduce brightness in the area speedily to any desired level

Objectives	Behavioral Activities	Facilities Requirements
		123 Projective devices and screens should be positioned so that they are not obstructive when not in use, but quickly available when wanted
		124 Power sources should be conveniently located so that it is not necessary to bend low to plug in, nor to extend wires when positioning equipment for individual or group use
		125 Security storage should be provided for projection devices, close to point of use
	I. Listening to tape, record, or cassette playback, or radio-as a group	126 Should be able to hear electronically-reproduced sound distinctly from any location in the area, with out requiring a volume of amplification which would disturb a group in an adjoining area
		127 Power sources should be s positioned that as many as four sound and projection devices can be used simultaneously for the same grou;
		128 Convenient security storage for audio equipment
	J. Individual use of projector, recorder, TV, Radio	129 Students should be able t use individual instructional devices without disturbing the group or other individuals engaged in the same or other activities
	K. Use of self-contained programmed instructional device	
		130 Power sources for individ ual instructional devices should be positioned so that a dozen students may simultaneously utilize them in a special area, which is at once a part of a larger learning are

Objectives	Behavioral Activities	Facilities Requirements
		and at the same time constitutes an enclave available to students from outside
		131 Stations for the use of individual instructional devices should be arranged so that students do not interfere with each other, and are not tempted to interfere
		132 Power outlets and connections to electronic devices must avoid shock hazard
		133 Convenient security storage for individual instructional devices
	L. Individual independent reference to books, pamphelets, magazines, newspapers, documents, files, recordings, films	134 Should be able to use reference materials on an unscheduled basis, with access arranged so that other students are not disturbed by the movement to and from the materials
		135 The distance from the usual locuc of learning activities to the instructional materia should be minimal
		136 Students should be able to use individual instructional materials under conditions of acoustical and visual privacy
		137 Students should have direct access to instructional materials without need of intermediation by others

Objectives	Behavioral Activities	Facilities Requirements
		138 A place for the purchase of printed and other instructional materials should be provided within the school
	M. Manipulation of artifacts and mechanical devices	139 Should be able to handle materials or artifacts which may be exhibited, and to operate working devices
	N. Meeting with a knowlegeable staff person or a visitor, on a one-to-one basis	140 The staff person should have a specific permanent location to which the student may come for assistance under conditions which offer aural privacy and a feeling of physical isolation
		141 A student should have available a space which can be scheduled for a private consultation with a visiting expert, either alone or in company with a few others
	O. Observing a demonstration	142 Space should be arranged so that groups of 25 to 100 can listen and observe, with ample space for each student
		143 Should be able to hear and see clearly from any location in the lecture space (see requirement 110)
		144 Should be able to take notes comfortably
		145 Lecturer should have facilities for presenting illustrative materials: science demonstrations; film; opaque and transparency projection; voice and recordings amplification
	P. Involvement in simulation or game	146 Should be able easily to rearrange furniture and provide space for free movement in physical simulations involving up to 25 persons

Objectives	Behavioral Activities	Facilities Requirements
31 Knowledge of body structure and functions	See Activities A - P in relation to Objectives 11,12,21,22,23	See requirements in relation to Behavioral Activities A - P
32 Knowledge of diseases and dysfunctions of the body	Additional activities:	
	A. Simulation of the immobilization of injured parts through the use of sling, splints, cast; and simulation of removal of immobilizers	311 See Requirements 521 and 522 below (examining room)
	B. Simulation of application and removal of bandages	
	C. Taking pluse and blood pressure; use of stethoscope	
	D. Practice of mouth-to mouth resuscitation, and cardiac massage	
	E. Visual and tactile study of body parts of self and of another student	Examining room - 312 Provide mirror 313 Provide adequate privacy
	F. Use of microscope	314 Available furniture, equipment, apparatus, materials, and utilities for individual conduc of scientific tests, analyses, experiments, investigations, including microscopy, histology dissection (also see Requiremen 451 below)
	G. Dissection of animal organs	
	H. Chemical analysis of blood	
	I. Identification of drugs and poisons	
	J. Experimentation in sensory perception	See 110 (learning area) 521 (examining room)
	K. Application of rehabilitative techniques: arts-crafts, diathermy, ultrasonics, passive exercise, whirlpool bath	315 Therapy room, equipped with diathermy, ultrasonic, exercis and arts-crafts apparatus 316 Bathroom adjoining therapy roo equipped with whirlpool apparatus

Objectives	Behavioral Activities	Facilities Requirements
	L. Observation of children	See 110 (learning area) 451 (medical office)
	M. Field trips to medical facilities, and nurseries	
41 Effective communication with patients and visitors	A. Listening to information or instruction imparted by an adult or by peers	See Requirements 110-120 (learning area facilities)
	B. Observation of audio-visuals	See Requirements 121-133 (audio-visual facilities)
	C. Use of telephone	411 A simulated waiting room, with desk and telephone with selective controls (or teletrainer); also chairs, tables, lamps
	D. Reception of people in office	
	E. Maintenance of appointment diary	
	F. Compilation of patient histories through interview	
42 Effective relations with patients	A & B See Activities 41 A & B	See Reqs. 110-133, 411
a. Isolation when necessary b. Emergencies c. Comfort	C. Physical identification of communicable disease, or unsocial or dangerous behavior, through simulation games	
	D. Simulation of strategy for effecting isolation	
	E. Practice of first-aid procedures	
	F. Adjustment of mechanical controls of environmental conditioning apparatus	421 It should be possible to maintain levels of temperature, humidity, air-exchange, and light in the waiting room, with accessible controls which can be manipulated by students for the comfort of the occupants

Objectives	Behavioral Activities	Facilities Requirements
43 Maintenance of records, correspondence, appointments, and other clerical routines	A & B See item 41 A & B C. Filing papers, forms, and charts D. Filing publications E. Bookkeeping F. Entering medical data on forms and charts G. Payment of salaries and maintenance of payrool records H. Inventory of supplies I. Letter writing J. Typing K. Recording and transcribing L. Operation of duplicating machines M. Operation of calulators N. Preparation of letters and packages for mailing O. Sorting of incoming mail P. Maintenance of physician's calendar Q. Arrangement of travel itinerary and reservations	See Reqs. 110-133, 411 431 An office area in which 25 students can practice various clerical procedures without interfering with each other This area should have space for the following office equipment, together with available electric connections: a. file cabinets b. shelving for magazines and books c. calculators d. typewriters e. dictating machines and playbacks f. desks and tables g. telephones 432 A storage closet with shelving to accommodate: a. paper and envelopes b. forms and charts c. writing materials d. electronic equipment supplies e. drugs f. laboratory supplies (Note: Numbers and quantities must be included in the requirements listing; these will depend on the particular syllabus to be followed.)

Objectives	Behavioral Activities	Facilities Requirements
44 Efficient administration of office finances: fees, banking, insurance	A & B See Activities 41A&B C. Examination of fee and insurance schedules, and bank statements D. Writing receipts, checks, deposit slips E. Maintenance and reconciliation of check books and cash ledgers F. Completion of forms G. Simulation of explanation to patients of fees, payments, insurance reimbursement, and eligibility for social service aid H. Simulation of collection techniques: telephone, mail, collection agencies, governmental and charitable assistance	See Reqs. 110-133,431
45 Proper housekeep- facilities and equipment	A & B See Activities 41A&B C. Prepare a check-list for conformance of each space with standards of cleanliness, safety, comfort, and readiness D. Inspect premises for conformance with check-list standards E. Restock supplies and equipment F. Perform cleaning and maintenance procedures, or direct performance of others G. Clean, check and restock physician's bag	451 All components of a moder medical office: -waiting room (see 411) -consultation room -examining room -laboratory -X-ray room -office (see 431) -lavatory -therapy room -store room (see 432)

Objectives	Behavioral Activities	Facilities Requirements
51 Achievement of aseptic conditions in the medical premises	A. Acquisition of information re the history of microbiology, types of microorganisms, diseases they cause, and methods of transmission -see Activities 41A&B -reading in class and library -microscopy	See Reqs. 110-133 511 Library area for medical media 512 Microscopes; cabinets, sturdy tables, source of lighting for slides, projection capability
	B. Hand-washing; surgical scrub	513 Sink, hot water, soap and antiseptic dispensers
	C. Disposal of contaminated material	514 Waste disposal equipment
	D. Sterilization of instruments, materials, and solutions	515 Sterilizing equipment: autoclave boiler, oven; temperature controls
	E. Practice in handling sterile equipment and materials, and in preparing sterile field	516 Cabinet for chemicals See also Req. 314
52 Efficient conduct of examination porcedures	A & B See Activities 41A&B	See Reqs. 110-133
	C. Practice in setting up for complete physical examination	521 A patient examining room equipped with examining table, dressing alcove, sink, sterilizing equipment, scales, cabinet for medical supplies, intercom and telephone, electricity receptacles; with one glass wall for observation
	D. Performance of aseptic procedures preliminary to examination	
	E. Practice of assistant duties during examination	
	F. Practice in preparing patient, and in assisting patient on and off table	
	G. Measuring height and weight, and recording on charts	
	H. Taking temperature; recording; preparation of thermometer for use	

Objectives	Behavioral Activities	Facilities Requirements
	I. Taking and recording pulse, respiration and blood pressure	
	J. Practice in positioning and draping patient for examination, with appropriate instructions and demonstrations of empathy	522 Examining room should provide privacy for the patient
	K. Adjustment of controls of environmental conditioning apparatus	523 It should be possible to maintain comfortable levels of temperature, humidity, air-exchange, and light in the examining room, with accessible controls which can be manipulated by students
53 Self-direction of assistance of physician during diagnostic and therapeutic procedures	A&B See Activities 41 A&B	See Reqs. 110-133, 521
	C. Setting up equipment and materials for tests, treatments, survery, dressings, application of splints and casts, injections, sample collection	
	D. Preparation of patient for procedures in "C" above	
	E. Cleaning, sterilization, labeling, storage, and disposal of materials, equipment, and samples	
	F. Application and removal of dressings and bandages	
	G. Application and removal of splints and casts	
	H. Simulation of anesthesia administration, incision, drainage, suturing, injection	

Objectives	Behavioral Activities	Facilities Requirements
54 Absolute control in handling of pharmacological substances	A. Acquisition of information re function, dosages, administering, shelf-life, legality, of medically-used drugs	See Reqs. 110-133
	-see Activities 41 A&B	
	-reading in class and library	See Reqs. 134-138, 511
	B. Practice in entering drug acquisitions and dispensations in legally required record books	
	C. Practice in decoding and translating prescriptions	
	D. Storage, inventory, and locating of simulated drugs, according to class and expiration date	See Req. 432 541 Provide security for drug storage
	E. Refrigeration of specified drugs (simulated)	542 Provide refrigeration facility in storage area (432)
55 Competency in First-Aid	A. Study of First-Aid situations and procedures (Red Cross)	See Reqs. 110-133
	B. Practice of First-Aid procedures	
	C. Setting-up of an "always ready" tray	See Req. 432
	D. Simulation of the location and measuring of drugs in accord with physician's directions	
	E. Simulation of process of finding physician when not present	

Objectives	Behavioral Activities	Facilities Requirements
61 Competency in chemical and histological analyses:	A&B See Activities 41 A&B	See Reqs. 110-133
	C. Analysis of urine	See Req. 512
-urinalysis -hematology	D. Performanc of hemoglobin and hematocrit determinations	611 Facilities for chemical analysis: table (or counter), sink, cabinet for chemicals, centrifuge, source for heating and power
-bacteriology	D. Drawing of specimens from practice model	
	F. Calculation of blood counts	612 Hemoglobinometer
		613 Practice model
		614 Counting chamber
	G. Preparation of stained slides, and culture media	See Req. 512
	H. Setting up, reading, and recording sedimentation rates	
	I. Reception of samples from patients	615 Designated sample reception station at point convenient to patients
62 Competency in administering physical tests:	A&B See Activities 41 A&B	See Reqs. 110-133
-electrocardiography	C. Setting-up electrocardiograph machine, preparing patient, test operation, mounting test result	621 Testing room; electrocardiograph, audiometer, eye charts, skin testing equipment
-audiometry		622 Station for recording, charting reading, mounting test results
-visual acuity	D. Assisting in hearing test; charting result	
-radiology	E. Practice in administering skin test	
-skin tests		
	F. Performing visual acuity test and recording results	623 Visual acuity testing area requires uninterrupted sight-line for reading chart; dimensions as stipulated in optometrical practice

Objectives	Behavioral Activities	Facilities Requirements
	G. Simulation of preparing patient for X-ray and assisting patient into position	624 Photography room to house X-ray camera, provided with anti-radiation devices
	H. Preparation of X-ray file cards and envelopes; practice in filing	625 Area for housing X-ray record system
	I. Developing X-ray film	626 Dark area for developing X-ray film
	J. Loading X-ray film	
63 Competency in assisting in therapeutic procedures	A. Simulation of roles in therapeutic procedures	631 Area for housing equipment, and for administering therapy

C

COER Career Development Center

Medical Assisting Curriculum

	Periods per wk
A. Group learning (conceptual)	
class discussion	3
game and role-playing	1
audio-visual	1
B. Individual inquiry (conceptual)	5
media center	
conference rooms	
C. Practical experience (medical practices)	5
therapy waiting room consultation room examining room testing sterilizing chemical and drug storage sample reception lavatory X-ray administration and developing	
D. Practical experience (business routines)	5
appointments records filing forms billing mailing telephone banking records ordering inventory storage	
D. Practical experience (laboratory)	5
analyses physiology chemistry pharmacology	

C

COER Career Development Center

Weekly Programs

Mechanical Trades

Subject	Power Mechanics	Electric/ Electronic	Building
Shop	15 periods	15 periods	15 periods
Lab science	2	2	1
Tool shop	2	1	2
Blue print reading	1	1	2
Audio-visual	1	1	1
Class discussion	2	2	2
Independent study	2	2	2
Computer Lab-Info systems	-	1	-
	25	25	25

Medical Assisting

Medical office practice	5 periods
Bio/chem lab	5
Business routines	5
Independent study	5
Class discussion	3
Audio-visual	1
Games and role-playing	1
	25

Business

Practice and procedures	25 periods

C

COER CAREER DEVELOPMENT CENTER

Spaces Needed for Medical-Assisting

as determined by analysis of the curriculum

Area	Min. sq. ft. required
1. Classroom	700
*2. Audio-visual area	1000
*3. Media center	3000
*4. Conference space	800
#5. Lecture area	2000 (see note)
6. Game and role-playing area	Classroom
7. Laboratory	1250
8. Therapy room	400
9. Therapy lavatory	50
10. Waiting room	400
11. Business office	1250
12. Supplies storage (instructional purpose)	600
13. Consultation room	250
14. Examining room	125
15. X-ray room	300
16. Lavatory	50
17. Microscopy area	Laboratory
18. Sterilizing area	150
19. Chemical storage	Storage room
20. Drug Storage	Storage room
21. Sample reception area	150
22. Testing room	600

Area (cont'd)	Min. sq. ft. required (cont'd)
23. X-ray developing room	150

*to be used jointly with other occupational training groups.

#As a result of the preparation of class schedules for medical-assistant, as well as for other occupational groups, it was found that only one class in any occupation could be assigned to a lecture area at any one time; therefore there would be no direct instructional need for such a large area. In the event of a conversion of a school building to a career center, an existing auditorium could of course be used for lectures and meetings. In a new building the media center could be used on occasion.

COER Career Development Center

Guidelines for mechanical trades schedules

1. Shop classes - either:

   a. 3 days of 3 consecutive periods and
   2 days of double and single periods
   or

   b. 2 days of 3 consecutive periods and
   3 days of double and single periods

2. Tool shop and
   Lab - double periods, always consecutive

3. Independent study -

   a. no more than one class assigned to independent study per period per trade

   b. no more than one period of independent study per class per day

4. Class discussion - no more than one period per class per day

D

Medical Assisting - Program Schedule

Period	Class	M	T	W	Th	F
1	I	Classroom	AV	Classroom	Game (CR)	Classroom
	II	Medical	Medical	Medical	Medical	Medical
	III	Lab	Lab	Lab	Lab	Lab
	IV	Business	Business	Business	Business	Business
	V	Indiv. Study	I.S.	I.S.	I.S.	I.S.
2	I	Medical	Medical	Medical	Medical	Medical
	II	Classroom	AV	Classroom	Game (CR)	Classroom
	III	Indiv. Study	I.S.	I.S.	I.S.	I.S.
	IV	Lab	Lab	Lab	Lab	Lab
	V	Business	Business	Business	Business	Business
3	I	Business	Business	Business	Business	Business
	II	Lab	Lab	Lab	Lab	Lab
	III	Classroom	AV	Classroom	Game (CR)	Classroom
	IV	Indiv. Study	I.S.	I.S.	I.S.	I.S.
	V	Medical	Medical	Medical	Medical	Medical
4	I	Indiv. Study	I.S.	I.S.	I.S.	I.S.
	II	Business	Business	Business	Business	Business
	III	Medical	Medical	Medical	Medical	Medical
	IV	Classroom	AV	Classroom	Game (CR)	Classroom
	V	Lab	Lab	Lab	Lab	Lab
5	I	Lab	Lab	Lab	Lab	Lab
	II	Indiv. Study	I.S.	I.S.	I.S.	I.S.
	III	Business	Business	Business	Business	Business
	IV	Medical	Medical	Medical	Medical	Medical
	V	Classroom	AV	Classroom	Game (CR)	Classroom

C R - Class Room

I S - Independent Study (Media Center)

A V - Audio Visual

Lab - Physics/Chem. Lab

D

Building Trades - Program Schedule

Period	Class	M	T	W	Th	F
1	I	Tool	I.S.	Lab	Shop	Shop
	II	Shop	BP (CR II)	Shop	Shop	Shop
	III	Shop	Shop	I.S.	CR II	BP (CR II)
	IV	CR II	Shop	Shop	Shop	I.S.
	V	Shop	Shop	Shop	CR I	Shop
2	I	Tool	Shop	Shop	Shop	I.S.
	II	Shop	CR I	Shop	Shop	Shop
	III	Shop	Tool	Shop	AV	CR I
	IV	Shop	Shop	AV	Shop	Shop
	V	I.S.	Shop	BP (CR II)	I.S.	Shop
3	I	Shop	CR I	Shop	BP (CR II)	Shop
	II	Tool	Shop	I.S.	AV	Shop
	III	Lab	Tool	Shop	Shop	Shop
	IV	Shop	Shop	BP (CR II)	Shop	Lab
	V	Shop	Shop	Shop	Shop	Tool
4	I	Shop	Shop	Shop	CR I	Shop
	II	Tool	Shop	BP (CR II)	Shop	CR II
	III	Shop	Shop	I.S.	Shop	Shop
	IV	BP (CR II)	Tool	Shop	I.S.	Shop
	V	Shop	BP (CR II)	Shop	Shop	Tool
5	I	Shop	Shop	BP (CR II)	Shop	AV
	II	Shop	Shop	Shop	Lab	I.S.
	III	BP (CR II)	Shop	Shop	Shop	Shop
	IV	Shop	Tool	Shop	CR II	Shop
	V	AV	Lab	CR I	Shop	Shop

CR I)Class Room
CR II)

B.P. = Bule Print reading

I.S. = Independent Study (Media Center)

Shop has capacity for 3 classes

Tool = Tool Shop

Lab = Physics/Chem. Lab

A-V = Audio Visual

D

Power Mechanics - Program Schedule

Period	Class	M	T	W	Th	F
1	I	Shop	Shop	Shop	Shop	AV
	II	Shop	Shop	Shop	Shop	Shop
	III	Shop	I.S.	Shop	Shop	Shop
	IV	AV	Lab	Tool	I.S.	Shop
	V	CR	Shop	CR	Lab	Tool
2	I	Shop	Shop	Shop	Tool	Shop
	II	Shop	Shop	Shop	Shop	Shop
	III	Shop	Shop	Lab	Shop	Shop
	IV	CR	Lab	Tool	Shop	Shop
	V	AV	I.S.	Shop	Lab	Tool
3	I	Shop	Shop	Shop	Tool	CR
	II	CR (BP)	Lab	Shop	Shop	Shop
	III	AV	Shop	Lab	Shop	Shop
	IV	Shop	CR (BP)	Shop	CR	CR (BP)
	V	Shop	CR (BP)	I.S.	Shop	Shop
4	I	Lab	I.S.	CR	Shop	Shop
	II	I.S.	Lab	Tool	I.S.	AV
	III	Shop	Shop	Shop	Tool	I.S.
	IV	Shop	Shop	Shop	Shop	Shop
	V	Shop	Shop	Shop	Shop	Shop
5	I	Lab	CR (BP)	I.S.	Shop	Shop
	II	Shop	Shop	Tool	CR	CR
	III	CR	CR	Shop	Tool	CR (BP)
	IV	Shop	Shop	Shop	Shop	Shop
	I	Shop	Shop	Shop	Shop	Shop

I.S.= Independent Study (Media Center)

C.R.= Classroom

C.R.(BP)= Classroom - Blue Print Reading

Shop has capacity for 3 classes

AV= Audio-Visual

Tool=Tool Shop

D

Electric / Electronic Appliance Repair

Period	Class	M	T	W	Th	F
1	I	Lab	Shop	I.S.	Tool	Shop
	II	I.S.	Tool	Shop	AV	CR I
	III	Shop	Shop	Shop	Shop	Shop
	IV	Shop	Shop	BP (CR II)	Shop	Lab
	V	Shop	CR I	Shop	Shop	Shop
2	I	Lab	Shop	CR I	CR I	BP (CR II)
	II	Shop	I.S.	Shop	BP (CR II)	Shop
	III	Shop	BP (CR II)	Shop	Shop	Shop
	IV	Shop	Shop	Shop	Shop	Lab
	V	CR II	Shop	Comp. Lab	Shop	Shop
3	I	Shop	Comp. Lab	Shop	Shop	AV
	II	CR I	Shop	Shop	Shop	Comp. Lab
	III	Shop	I.S.	Shop	Lab	Shop
	IV	Shop	Shop	CR I	I.S.	Shop
	V	I.S.	Shop	Tool	Shop	Shop
4	I	Shop	I.S.	Shop	Shop	Shop
	II	Shop	Shop	Lab	Shop	Shop
	III	CR I	Shop	AV	Lab	CR I
	IV	AV	CR I	Shop	Shop	Shop
	V	Shop	Shop	Shop	BP (CR II)	Lab
5	I	Shop	Shop	Shop	Shop	Shop
	II	Shop	Shop	Lab	Shop	Shop
	III	I.S.	Shop	Comp. Lab	Shop	Tool
	IV	Tool	Comp. Lab	Shop	I.S.	Shop
	V	Shop	I.S.	Shop	AV	Lab

C

CR I)
CRII) Class Rooms

B.P. = Blue Print reading

I.S. = Independent Study (Media Center)

Tool = Tool Shop

Lab = Physics/Chem. Lab

Comp. Lab = Computer Lab. (Info Systems Center)

A-V = Audio Visual

Shop has capacity for 3 classes

Mechanical Cluster Schedule of Common Rooms *

Period	M CR I	M CR II	M Lab	M Tool	M AV	T CR I	T CR II	T Lab	T Tool	T AV	W CR I	W CR II	W Lab	W Tool	W AV	Th CR I	Th CR II	Th Lab	Th Tool	Th AV	F CR I	F CR II	F Lab	F Tool	F AV
1	PM V	BT IV	EE I	BT I	PM IV	EE V	BT II (BP)	PM IV	EE II	MA	PM V	EE IV (BP)	BT I	PM IV	Bus	BT V	BT III	PM V	EE I	EE II	EE II	BT III (BP)	EE IV	PM V	PM I
2	PM IV	EE V	EE I	BT I	PM V	BT II	EE III (BP)	PM IV	BT III	MA	EE I	BT V (BP)	AM III	PM IV	BT IV	EE I	EE II (BP)	PM V	PM I	BT III	BT III	EE I (BP)	EE IV	PM V	Bus
3	EE II	PM I (BP)	BT III	BT II	PM III	BT I	PM I (BP)	PM II	BT III	MA	EE IV	BT IV (BP)	PM III	EE V	Bus	PM IV	BT I (BP)	EE III	PM I	BT II	PM I	PM IV (BP)	BT IV	BT V	EE I
4	EE III	BT IV (BP)	PM I	BT II	EE IV	EE IV	BT V (BP)	PM II	BT IV	MA	PM I	BT II (BP)	EE II	PM II	EE III	BT I	EE V (BP)	EE III	PM III	Bus	EE III	BT II	EE V	BT V	PM II
5	PM III	BT III (BP)	PM I	EE IV	BT V	PM III	PM I (BP)	BT V	BT IV	MA	BT V	BT I (BP)	EE II	PM II	Bus	PM II	BT IV	BT II	PM III	EE V	PM II	PM II	EE V	EE III	BT I

* including AV for all clusters

Comp=computer lab
BP=Blue Print reading
CR=classroom
Lab= Physics/Chem Lab.
Tool=power tool shop

A-V= Audio-Visual
MA=Medical Assisting
PM=Power Mechanics.
E/E=Electrical/Electronic Appliance Repair Class
BT= Building trades Class

E

Building Survey Form*

Name of Building

Address

Owner

Date of Original Construction __________ Number of Stories ______

Date of Additions, if any ____

____

Approximate Total Square Footage ____________

Appraised by ______________________________ Date ____________

SITE CHARACTERISTICS

Size and shape - expansion potential

Soil and drainage

Nature of surface

Topography - elevation

- landscaping and sidewalks

- access roads

- traffic patterns and streets

---

* for evaluating existing buildings for conversion to a Career Development Center/ Skills Center.

Nearby transportation

School bus traffic patterns and parking

Parking - location, size

Delivery and storage dock

Waste storage

Fencing and security

Hydrants

Commercial noise (lack of)

Outside lighting

STRUCTURAL CHARACTERISTICS* (After each item, rate on a scale of 1 to 5, with 5 the most favorable rating and write comments, if any, under item.)

Gross Structure - condition and appearance ______

- type of construction (cement, brick, wood, etc.) ______

- Foundation ______

- Height ______

- Walls, type (plaster, gypsum, block, etc.) ______
  (load bearing or non-bearing)

- Floors, type (tile, wood, concrete, etc.) ______
  (loading capacity)

- Ceiling ______

- Roof ______

- Entrance and exits ______

- Insulation (sound, vibration) ______

Internal Structure - Safety Code Considerations

- Width of entrances, corridors, stairways & doors

- Elevator, freight ______

- Basement ______

- Windows ______

- Partitions ______

- Spatial relationships ______ (circulation, lobbies, corridors, stairwells)

- Provision for physically handicapped ______

- Fenestration ______

- Acoustics ______

SERVICE SYSTEMS

Heating (gas, oil, coal)

Ventilation (type, location, capacity)

Air Conditioning (amount, location)

Lighting (type and quality)

Water (age and condition) - Hot

- Cold

- Drains

- Sewers

Compressed Air

Gas

Vacuum

Electrical - Source of power and type

- Primary service distribution

- Secondary supply lines

- Control devices

- Building service wiring

- Metering

Communications - Telephone

- Intercom

- CCTV

- Buzzer
- Clock

Maintenance and Operational - Receiving
- Storage
- Custodial

Safety - Fire Protection - Sprinkler
- Alarm
- Exits
- Extinguishers
- Storage combustibles
- Shower
- Fire Hose

- Building Illumination (emergency)
- Corridors

- Classrooms

- Shops

- Exterior

- Date of building inspection
  - Fire
  - Electrical
  - Heating Plant
  - Insurance
  - Public health
  - Other

Storage - Trash disposal

- Supplies

Restrooms (condition: student, faculty)

Classrooms - General

- Electrical outlets

- Furniture

- Bulletin boards
- Chalk boards
- Ability to darken
- Lighting (type and quality)

Shops - General

- Electrical outlets
- Furniture
- Bulletin boards
- Chalk boards
- Ability to darken
- Lighting (type and quality)
- Major equipment available
- Ventilation
- Floor load problems

SCHOOL BUILDING SURVEY

Schedule of Spaces

	Area		Student		Floors		Services				
Function*	sq ft	Shape	Capacity	Lighting#	Type	Walls@	HW	CW	Air	Elec	Comments

*List of spaces to be included: classrooms, shops, laboratories, cafeteria, auditorium, library, gymnasium, remedial, guidance, student activities, offices, health, teachers' room, custodial, storage, lockers.

#Indicate whether natural or artificial.

@Indicate bearing/non-bearing.

ATTACHMENT J

The following information sheets represent examples of alternative transportation patterns which might be used between the Fordham Road site and any of the academic and comprehensive high schools. Finalized transportation patterns, with estimated travel times, can be established once a specific site is selected. The Metropolitan Transportation Authority can provide information on the best routes, via subway and bus, as well as estimated travel times.

ATTACHMENT J
TRANSPORTATION PATTERNS

FROM: CLINTON HIGH SCHOOL TO: FORDHAM ROAD

BY TRAIN:	IRT			IND		3 Ave. EL	uptown	downtown
	4	5	6	cc	d			
	☒	☐	☐	☐	☐	☐	☐	☒

from Mosholu Pkwy. & Jerome Avenue to Fordham Road

transfer to:

☐ train	IRT			IND		3 Ave. EL	uptown	downtown
	4	5	6	CC	D			
	☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ______

to: Fordham Road

BY BUS:

2 (150th St. - Melrose Ave.) from Mosholu Pkwy.

BX # 1 (Concourse - 138th Street) from Mosholu Pkwy.

to Fordham Road

transfer to:

☐ train	IRT			IND		3 Ave. EL	uptown	downtown
	4	5	6	CC	D			
	☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ______

to ______

Comments:

TRANSPORTATION PATTERNS

FROM: COLUMBUS HIGH SCHOOL TO: FORDHAM ROAD

BY TRAIN: IRT 4 ☐ 5 ☐ 6 ☐ IND cc ☐ d ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

from ______ to ______

transfer to:

☐ train IRT 4 ☐ 5 ☐ 6 ☐ IND CC ☐ D ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

☐ bus BX # ______ ( ) from ______

to: ______

BY BUS:

BX # 12 (207th Street Broadway IND) from Pelham Pkwy. & Bronxwood Avenue

to Fordham Road

transfer to:

☐ train IRT 4 ☐ 5 ☐ 6 ☐ IND CC ☐ D ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

☐ bus BX # ______ ( ) from ______

to ______

Comments:

TRANSPORTATION PATTERNS

FROM: COLUMBUS HIGH SCHOOL TO: FORDHAM ROAD

BY TRAIN:

IRT: 4 ☐ 5 ☐ 6 ☐ IND: cc ☐ d ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

from ____________ to ____________

transfer to:

☐ train — IRT: 4 ☐ 5 ☐ 6 ☐ IND: CC ☐ D ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

☐ bus — BX # ______ ( ) from ____________

to: ____________

BY BUS:

BX # 12 (207th Street Broadway IND) from Pelham Pkwy. & Bronxwood Avenue

to Fordham Road

transfer to:

☐ train — IRT: 4 ☐ 5 ☐ 6 ☐ IND: CC ☐ D ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

☐ bus — BX # ______ ( ) from ____________

to ____________

Comments:

TRANSPORTATION PATTERNS

FROM: Lehman High School TO: Fordham Road

BY TRAIN:

IRT			IND		3 Ave. EL	uptown	downtown
4	5	6	cc	d			
☐	☐	☒	☐	☐	☐	☐	☒

from Westchester Square to 125th Street, Manhattan

transfer to:

☒ train

IRT			IND		3 Ave. EL	uptown	downtown
4	5	6	CC	D			
☒	☐	☐	☐	☐	☐	☒	☐

☐ bus BX # ______ ( ) from ______

to: Fordham Road

BY BUS:

BX # 40 (Burnside Sedgewick) from E. Tremont Avenue

to Southern Boulevard

transfer to:

☐ train

IRT			IND		3 Ave. EL	uptown	downtown
4	5	6	CC	D			
☐	☐	☐	☐	☐	☐	☐	☐

☒ bus BX # 31 (Southern Boulevard Fordham Road) from Southern Boulevard

to Fordham Road

Comments:

TRANSPORTATION PATTERNS

FROM: MONROE HIGH SCHOOL TO: FORDHAM ROAD

*BY TRAIN:	IRT			IND		3 Ave. EL		uptown	downtown
	4	5	6	cc	d				
	☐	☐	☒	☐	☐	☐		☐	☒

from Elder & Westchester Avenue to 125th Street - Manhattan

	transfer to:								
☒ train	IRT			IND		3 Ave. EL	uptown	downtown	
	4	5	6	CC	D				
	☒	☐	☐	☐	☐	☐	☒	☐	
☐ bus	BX # ____ ( ) from ____								

to: Fordham Road

BY BUS:

BX # 36 (181st Street - Wadsworth Avenue) from E. 174th Street

to Crotona Avenue

	transfer to:							
☐ train	IRT			IND		3 Ave. EL	uptown	downtown
	4	5	6	CC	D			
	☐	☐	☐	☐	☐	☐	☐	☐
☒ bus	BX # 3 (Fordham Plaza) from Crotona Ave. & W. 180th St.							

to Fordham Road

Comments:

* Having to travel to Manhattan by subway to transfer to come back to Fordham Road may not be acceptable.

TRANSPORTATION PATTERNS

FROM: Morris High School TO: Fordham Road

BY TRAIN:

IRT 4	IRT 5	IRT 6	IND cc	IND d	3 Ave. EL	uptown	downtown
☐	☐	☐	☐	☐	☒	☒	☐

from 160th St. and 3rd Avenue to Fordham Road

transfer to:

☐ train

IRT 4	IRT 5	IRT 6	IND CC	IND D	3 Ave. EL	uptown	downtown
☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ______

to: ______

BY BUS:

BX # ______ ( ) from ______

to ______

transfer to:

☐ train

IRT 4	IRT 5	IRT 6	IND CC	IND D	3 Ave. EL	uptown	downtown
☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ______

to ______

Comments:

TRANSPORTATION PATTERNS

* FROM: ROOSEVELT HIGH SCHOOL TO: FORDHAM ROAD

BY TRAIN: IRT 4 ☐ 5 ☐ 6 ☐ IND cc ☐ d ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

from ______________________ to ______________________

transfer to:

☐ train IRT 4 ☐ 5 ☐ 6 ☐ IND CC ☐ D ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

☐ bus BX # ______ ( ) from ______________________

to: ______________________

BY BUS: BX # ______ ( ) from ______________________

to ______________________

transfer to:

☐ train IRT 4 ☐ 5 ☐ 6 ☐ IND CC ☐ D ☐ 3 Ave. EL ☐ uptown ☐ downtown ☐

☐ bus BX # ______ ( ) from ______________________

to ______________________

Comments:

* Within walking distance.

TRANSPORTATION PATTERNS

FROM: STEVENSON HIGH SCHOOL TO: FORDHAM ROAD

	IRT			IND		3 Ave. EL	uptown	downtown
BY TRAIN:	4	5	6	cc	d			
	☐	☐	☐	☐	☐	☐	☐	☐

from ______ to ______

transfer to:

	IRT			IND		3 Ave. EL	uptown	downtown
☐ train	4	5	6	CC	D			
	☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ______

to: ______

* BY BUS:

BX # 5 (Southern Blvd. - Westchester Ave.) from Story Avenue

to Westchester Avenue

transfer to:

	IRT			IND		3 Ave. EL	uptown	downtown
☐ train	4	5	6	CC	D			
	☐	☐	☐	☐	☐	☐	☐	☐

☒ bus BX # 31 (Southern Boulevard - Fordham Road) from Westchester Ave. & Southern Blvd.

to Fordham Road

Comments:

* May require a second transfer if location is too far west.

TRANSPORTATION PATTERNS

FROM: TAFT HIGH SCHOOL TO: FORDHAM ROAD

BY TRAIN:

IRT 4	IRT 5	IRT 6	IND cc	IND d	3 Ave. EL	uptown	downtown
☐	☐	☐	☒	☒	☐	☒	☐

from E. 170th St. & Grand Concourse to Fordham Road

transfer to:

☐ train

IRT 4	IRT 5	IRT 6	IND CC	IND D	3 Ave. EL	uptown	downtown
☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ______

to: ______

BY BUS:

BX # ______ ( ) from ______

to ______

transfer to:

☐ train

IRT 4	IRT 5	IRT 6	IND CC	IND D	3 Ave. EL	uptown	downtown
☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ______

to ______

Comments:

TRANSPORTATION PATTERNS

FROM: TRUMAN HIGH SCHOOL TO: ____________

*BY TRAIN:

IRT			IND		3 Ave. EL	uptown	downtown
4	5	6	cc	d			
☐	☒	☐	☐	☐	☐	☐	☒

from Baychester Avenue to 149th Street & Grand Concourse

transfer to:

☒ train

IRT			IND		3 Ave. EL	uptown	downtown
4	5	6	CC	D			
☒	☐	☐	☐	☐	☐	☒	☐

☐ bus BX # ______ ( ) from ____________

to: Fordham Road

** BY BUS:

BX # 15 (Valentine Ave. - 192nd Street.) from Baychester Avenue
to Fordham Road/OR - to White Plains Road

transfer to:

☐ train

IRT			IND		3 Ave. EL	uptown	downtown
4	5	6	CC	D			
☐	☐	☐	☐	☐	☐	☐	☐

☒ bus BX # 41 (136th St. - Lincoln Avenue) from White Plains Road

to Fordham Road

Comments:

* The train may be too far a walk from TRUMAN.

** May be faster to transfer to BX41 rather than take BX 15 all the way.

TRANSPORTATION PATTERNS

FROM: WALTON HIGH SCHOOL TO: FORDHAM ROAD

BY TRAIN:

	IRT 4	IRT 5	IRT 6	IND cc	IND d	3 Ave. EL	uptown	downtown
	☐	☐	☐	☐	☐	☐	☐	☐

from ____________ to ____________

transfer to:

	IRT 4	IRT 5	IRT 6	IND CC	IND D	3 Ave. EL	uptown	downtown
☐ train	☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ____________

to: ____________

BY BUS:

BX # 25 (137th Street - Lincoln Avenue) from E. 195th Street

to Fordham Road

transfer to:

	IRT 4	IRT 5	IRT 6	IND CC	IND D	3 Ave. EL	uptown	downtown
☐ train	☐	☐	☐	☐	☐	☐	☐	☐

☐ bus BX # ______ ( ) from ____________

to ____________

Comments:

FROM: ______________________________

TO:

A. E. Smith - 333 E. 151st Street - Bronx 10451

Route: ______________________ Estimated Time _______

G. H. Dodge - 189th Street & Crotona Avenue - Bronx 10458

Route: ______________________ Estimated Time _______

J. Addams - 900 Tinton Avenue - Bronx 10456

Route: ______________________ Estimated Time _______

S. Gompers - 455 Southern Boulevard - Bronx 10455

Route: ______________________ Estimated Time _______

A. E. Stevenson - 1980 Lafayette Avenue - Bronx 10473

Route: ______________________ Estimated Time _______

H. S. Science - 75 W. 205th Street - Bronx 10468

Route: ______________________ Estimated Time _______

C. Columbus - 925 Astor Avenue - Bronx 10469

Route: ______________________ Estimated Time _______

D. Clinton - Mosholu Parkway & Paul Avenue - Bronx 10468

Route: ______________________ Estimated Time _______

E. Childs - 800 E. Gun Hill Road - Bronx 10467

Route: ______________________ Estimated Time _______

H. S. Truman - 750 Baychester Avenue - Bronx 10475

Route: ______________________ Estimated Time _______

H. Lehman - 3000 E. Tremont Avenue - Bronx 10461

Route:____________________________________Estimated Time_______

James Monroe - 1300 Boynton Avenue - Bronx 10461

Route:____________________________________Estimated Time_______

Morris - 166 Street & Boston Road - Bronx 10472

Route:____________________________________Estimated Time_______

T. Roosevelt - 500 E. Fordham Road - Bronx 10458

Route:____________________________________Estimated Time_______

Walton - W. 195th Street & Reservoir Avenue - Bronx 10468

Route:____________________________________Estimated Time_______

Taft - 240 E. 172nd Street - Bronx 10457

Route:____________________________________Estimated Time_______

J. Kennedy - W. 228 Street & Ewen Avenue - Bronx

Route:____________________________________Estimated Time_______